

AMERICAN NEUROLOGICAL ASSOCIATION.

EIGHTH ANNUAL MEETING.

(OFFICIALLY REPORTED BY M. JOSIAH ROBERTS, M.D.)

First day, afternoon session.

WILLIAM A. HAMMOND, M.D., President, in the Chair.

The AMERICAN NEUROLOGICAL ASSOCIATION convened in the New York Academy of Medicine, June 21, 1882, for its eighth annual meeting. In the absence of the retiring President, Dr. Robert Bartholow, the Secretary, Dr. Seguin, called the Association to order at 2:30 P.M., and introduced the President-elect, Dr. William A. Hammond, of New York.

Present—Drs. Amidon, Bannister, Beard, Birdsall, Edes, W. A. Hammond, G. M. Hammond, Gibney, Gray, McBride, Miles, Morton, Ott, Putnam, Rockwell, Seguin, Shaw, Spitzka, and Webber.

Dr. HAMMOND thanked the Association for the honor conferred upon him by electing him to the presidency. He thought the Association had great cause for congratulation for the work it had already done in view of the indifference of many and the hostility of a few. During the present meeting a number of important and interesting papers would be read. Nowhere in the world was neurological science better cultivated than in this country, and he thought the Association had no reason to feel ashamed of the part it had taken in it. There was one point which he wished to call attention to, namely, the formation of local neurological societies throughout the country. These would be a great stimulus to special work and would serve as feeders to the Association. As proof of the value of such local societies for this purpose we had only to look at the New York Neurological Society.

The reading of the minutes of the last annual meeting being called for, it was moved by Dr. McBRIDE that as they had been printed and sent to each member for perusal their reading should be dispensed with. Carried.

Dr. SEGUIN reported that the Council recommended the notification of the delinquent members before acting in accordance with Art. 8 of the by-laws. Upon motion of Dr. SHAW the recommendation of the Council was adopted.

The Secretary, Dr. SEGUIN, reported that he had received a letter from Dr. Bartholow, dated June 20th, expressing his regrets at not being able to be present. He also reported the receipt of several pamphlets and monographs from Dr. M. Bernhardt, associate member of the Association.

The Treasurer, Dr. SEGUIN, then made his report, which, upon motion, was adopted.

NOMINATION OF CANDIDATES.

Dr. GEO. M. BEARD nominated Dr. C. L. Dana, of New York, Seconded by Dr. J. C. Shaw.

Dr. J. J. PUTNAM nominated Dr. C. F. Folsom, of Boston. Seconded by Dr. R. T. Edes.

NOMINATION OF OFFICERS.

Dr. T. A. McBRIDE nominated Dr. R. T. Edes, of Boston, for president.

Dr. E. C. SPITZKA moved that nominations for president be closed. Carried.

Dr. SHAW nominated Dr. W. J. Morton for Vice-President.

Dr. J. J. PUTNAM nominated Dr. E. C. Seguin, the present incumbent, for Secretary and Treasurer.

MEMBERS OF COUNCIL.

Dr. Miles was nominated by Dr. McBRIDE.

Dr. Shaw was nominated by Dr. AMIDON.

Dr. McBRIDE moved that the Secretary cast the vote of the Association for all candidates for office. Seconded.

Dr. PUTNAM objected to this motion, for the reason that the Secretary might wish to vote for some member of the Association not nominated.

Dr. McBRIDE withdrew his motion.

The President appointed Drs. Putnam and G. M. Hammond as tellers.

Voting was by separate ballot, and resulted in the election of the gentlemen above nominated for the offices.

MISCELLANEOUS BUSINESS.

Dr. R. W. AMIDON moved that the place of next meeting be left to the discretion of the Council. Carried.

The Secretary, Dr. SEGUIN said he wished to call the attention of the Association to Dr. Jewell's amendment to the Constitution, due notice of which had already been given :

"That all active members of the Association who shall hereafter remove from within the limits of the United States, shall thereby become Associate Members should they so desire."

Dr. J. C. SHAW moved that the proposed amendment become a part of the Constitution. Carried.

Dr. SEGUIN gave notice that he had received a number of replies from gentlemen who had been elected Honorary and Associate Members of the Association. He held cordial letters of acknowledgment in his hand from Drs. W. Erb, of Leipzig ; C. Westphal, of Berlin ; H. C. Bastian, of London ; M. Bernhardt, of Berlin ; J. S. Lombard, of Leamington, England ; J. R. Reynolds, of London ; Thos. S. Dowse, of London ; J. Hughlings Jackson, of London ; H. Obersteiner, of Vienna ; and W. R. Gowers, of London.

Dr. E. C. SPITZKA moved that these letters be placed on file in the archives of the Association. Carried.

Dr. SEGUIN remarked that he held in his hand the first attempt at a printed programme. He had experienced great difficulty in securing the titles of papers to be read in sufficient time for printing and distribution. He recommended that the members of the Association be more prompt in the future in sending titles of their papers.

Dr. L. C. GRAY moved that the time for reading papers be limited to thirty minutes. Carried.

Dr. SEGUIN presented the following report of the Committee on the Hammond Prize :

"The Committee on the Hammond Prize, for the best essay upon the 'Functions of the Optic Thalamus in Man,' beg leave to present the following report.

"They have received only one essay, bearing the motto : '*Dans les sciences expérimentales quelques faits bien précis valent mieux que tous les raisonnements.*'

"This essay, written in French, presumably by an Italian physician, has been carefully read. It embraces a fair summary of the present state of science upon the question under study, and includes several interesting new cases of disease of the thalamus. It does not, however, contain any really original material, experimental, clinical, or pathological, and does not advance our knowledge of the functions of the thalamus.

"Consequently the Committee recommend that no award of the Hammond Prize be made this year, and they hope that this generous inducement to original research may be again offered to the scientific world.

"J. S. JEWELL (per E. C. S.).

"E. C. SEGUIN.

"F. T. MILES, *Chairman*."

President HAMMOND said he would very gladly renew his offer of the above-named prize for another year. If at the end of that time, the prize was not awarded, he would donate it to the Association, or to the New York Neurological Society, with the understanding that it should form the basis of a permanent fund for the promotion of original research.

Dr. SPITZKA moved that the present Committee on the Hammond Prize Essay be continued for another year. Carried.

There being no other miscellaneous business, the Association proceeded to its scientific work, and took up the order of papers.

"The myography of nerve degeneration in animals and man," by Dr. R. W. AMIDON, of New York.

The object of this paper is to study, by means of careful electrical examinations and myographic tracings, the effects of peripheral nerve injury in man; alongside of which to place similar observations on frogs whose nerves have been cut, and, by knowing the histological changes occurring in the frog, to infer that not dissimilar ones exist in man when the outward manifestations are the same.

As a sphygmogram is a pulse-tracing, so a myogram is a muscle-tracing. By means of a mechanism, to be described later, a muscle, by its contraction, moves a lever which makes a mark on the smoked paper of a revolving cylinder. It writes indelibly on paper the following facts: quickness of muscular contraction and relaxation (abruptness of the up- and down-stroke), amplitude of the muscular movement (height and breadth of curve), and,

by means of some accessory apparatus (the chronograph and the tuning-fork), the quickness of contraction after the application of stimuli (the latent period), and the effect of a continuance or a withdrawal of the same.

In the first place normal nerve and muscle reactions were taken in healthy frogs as follows : By means of a double interruptor the circuit carrying electricity to the frog is made and broken at the same time as the circuit of the chronograph, hence the moment the electricity reaches the muscle it also reaches the chronograph and breaks the line.

Having broken up the brain and spinal cord of the frog, to stop voluntary and reflex movements, the sciatic is exposed, the tendo Achillis is cut and fastened to the myograph needle, and the frog is securely pinned to a cork stage, with one electrode under the nerve and the other in some indifferent point, as the small of the back. We take the tracings produced by the cathode (neg.) closure contraction, cacc, and the anode (pos.) closure or opening contraction, ancc or anoc, excited by a small Grenet cell, and afterward the reaction to a secondary current of a Dubois induction apparatus. The same process is repeated with the muscle.

The sciatics of several frogs were cut and the animals were kept in a *very* warm room, so that nerve degeneration would not be retarded for perhaps weeks, as it sometimes is in frogs, especially in the winter.

The series of myograms obtained shows graphically the progressive changes, quantitative and qualitative, which an irreparable injury to a motor nerve produces in the tributary muscles.

The myographic studies undertaken in man were chiefly in cases of nerve injury, or diseases which cause nerve degeneration and muscular atrophy.

There was a striking similarity in these myograms. All are *delayed*, have a *sloping* up-stroke, a *rounded* top, a *sloping* down-stroke to a certain point where the muscle remains *tonically contracted* till a *fall* occurs, about as soon after the *breaking* of the current as it commenced after the *making*. Dr. Amidon asserted that a careful perusal of the explanatory text accompanying the plates, and a comparison of the different traces among them would show :

First, the identity as to form and relation of human and frog myograms in health.

Secondly, the great similarity of the pathological myograms in frogs and man (section or disease of nerves).

Thirdly, the marked myographic changes where slight trophic disturbances affect human muscles (disuse, muscular atrophy, etc.).

Fourthly, the profound alterations in contour of myograms of muscles for a long time severed from the vitalizing power of their nerve centres (chr. musc. atrophy, chr. poliomyelitis, etc.).

The future of human myography could not be predicted. It may become useful as a very accurate mode of differential diagnosis and prognosis. As an adjunct to our laboratories for the study of experimental therapeutics it needs no lauding. Its employment is far more simple and occupies much less time than one would think, and the American apparatus is so much cheaper than the imported, that it comes within the reach of almost any one.

Remarks on Dr. Amidon's Paper.

Dr. PUTNAM inquired if, in man, the prognosis was better when excessive anode action was less than cathode action.

Dr. AMIDON replied that he would not always give a bad prognosis when the anode was larger, but where the cathode was decidedly larger he would be certain of recovery.

Dr. PUTNAM remarked that it had seemed to him we might determine the period between contraction and excitation, and use it as a guide for determining electrical signals which would be available for diagnostic purposes instead of the form of curve.

Dr. AMIDON expressed the opinion that the plan suggested would be equally useful, if as accurate. Where the latent period is long you can observe it with the naked eye; but the graphic method he thought would better magnify the finer deviations.

Dr. W. J. MORTON inquired if the author of the paper took into consideration in his experiments the polar differences of the induced current. He was of the opinion that either one pole or the other had been used indifferently. There was a difference which he thought ought to be considered in fine investigations.

Dr. AMIDON did not think there was any polar difference. He had always used the secondary coil. That there was no difference between the two poles chemically he was certain.

Dr. MORTON did not think the chemical difference was great, but when it came to the question of physiological tetanus, that was something much easier to be seen and more pronounced than chemical differences.

Dr. ROCKWELL, in corroboration of Dr. Morton's remark, said that the negative pole of the induced current had a greater influence over the uterus than the positive, and he thought there must be a difference, which should be taken into account in such delicate experiments.

Dr. E. C. SEGUIN wished to ask Dr. Morton if he referred to the current of the secondary helix.

Dr. MORTON said that he referred to both the primary and the secondary; that the secondary current that corresponds to the break is greater than the secondary current that corresponds to the make. This point could easily be demonstrated by making the experiment. There was a decided difference no matter whether the primary or secondary coil of the induction apparatus was used.

Dr. SEGUIN labored under the impression that the current from the first helix had a strong direction or polar difference, while the current in the secondary helix was of equal intensity at each make and break, and that there was no polar difference. It would be difficult to imagine a polar difference in alternations of the same current.

Dr. MORTON stated, that if the original "break" current in the voltaic arc is stronger than the "make" current the coincident induced current must be stronger, whether it was a primary, secondary, tertiary, or further removed induced current.

At each make and break a given pole, say *A*, is quickly and alternately both $+$ and $-$; but since the tension of the break current is the greater of the two and has electricity of a constant sign at each of its ends, it results that *A* is always predominately $+$, and *B*, the other pole, always predominately $-$. Hence it is perfectly clear that the choice of poles does make a difference in deciding the presence or absence of the reaction of degeneration; in recording such observations the faradic pole employed to obtain muscular contractions should be noted.

Dr. W. R. BIRDSALL said it was not possible to determine that, for it was vibrating so rapidly that it could not be decided whether it was making or closing, no matter whether it happened to stop on the negative or positive pole.

Dr. AMIDON remarked that he had made so many observations that had there been any polar difference he would have observed it in his tracings.

There being no further discussion, Dr. SEGUIN called attention to the fact that a reporter from the lay press was present.

Dr. AMIDON moved that the proceedings of the Association be excluded from the lay press. Carried unanimously.

Dr. GEORGE M. BEARD, of New York, next read a paper entitled, "The symptoms of sanity and the diagnosis of insanity."

Dr. Beard stated that the object of his paper was twofold : *First*, to show what a sane man was, so that we can answer the question, "How can you tell a sane man when you see him?" The normal retina, the normal ear-drum, the normal throat, the normal condition of the different parts of the body generally, have long been studied in order to enable us to know when disease attacks the body ; but no one has studied the normal mind in such a way as to contrast it with an insane mind. The *second* object of his paper was to reconstruct the subject of insanity on the basis of evolution—to carry evolution into psychology. The law of evolution is the highest generalization the human mind has ever reached, and it is greater than gravity. It is revolutionizing the science of medicine. It originated, in its modern phase, in the brain of Herder, was developed more by Goethe, and more recently still by Darwin, who has just passed away, and by Herbert Spencer, and many others. Evolution in relation to medicine had been studied by Jackson, Mercier, and Ross. Dr. Beard said the symptoms of *sanity* were as follows :

1. Activity of the instinct of self-preservation.
2. Adaptation to environment.
3. Correspondence of character to age and station.
4. Rememberable consciousness.

He who responds to all these tests is a sane man, no matter how sick he may be in body or mind. He who does not respond to these tests is an insane man, no matter how well he may be in body. Insanity is a disease in which mental responsibility is seriously impaired. There can be no insanity with perfect responsibility. The very essence of insanity is irresponsibility. The mind may even be impaired, without being seriously impaired. For example, in hysteria, hypochondria, hysterio-epilepsy, and in neurasthenia, there may be mental impairment not serious enough to be insanity. Those who suffer from these diseases usually, in spite of their bodily and mental disease, and in spite of their mental impairment, retain activity of the instinct of self-preservation, adaptation to environment, correspondence of character to age and station, and rememberable consciousness.

Dr. Beard presented a drawing, after Möbius, of Leipzig, from a work on nervousness recently sent to him by the author. It was an interesting coincidence that Dr. Beard was working in the same line at the time he received this work. The figure of Möbius showed the relation of the different nervous diseases to each other—how they run into one another. Dr. Möbius' figure, however, was not based upon evolution, but so far as it went, was original, important, and in harmony with the facts observed. Dr. Beard's figure was based upon evolution. It represented the most important nervous diseases in the form of a tree, each disease being a branch; one side being devoted to the physical, the other to the mental diseases. On the mental side were trance, hypochondria, mental hysteria, hystero-epilepsy, and insanity. On the physical side, chorea, neuralgia, neurasthenia, physical hysteria, epilepsy, and paralysis, beginning from the bottom and going to the top of the tree. Dr. Beard said that when mental disease attacked a person the symptoms began from above downward, beginning with the tips of the branches and blossoms. The symptoms of insanity appear in the following order, the later acquisitions first disappearing, and then the earlier.

First.—There is a decline in manners, that is, minor morals; then more extensive moral decline.

Second.—Decline in the power of originating thought.

Third.—Decline in the power of acquiring thought.

Fourth.—Decline in memory of recent events.

Fifth.—Decline in memory of old events.

There can be no insanity without moral decline. All insanity is moral insanity. When a worm gnaws at the roots of a tree it is the blossoms that first begin to fade. When insanity attacks a mind it is the minor morals that are first destroyed. When an insane man wishes to kill, the chances are twenty-five to one he will kill himself. Next to himself he will kill some relative or friend he dearly loves, as wife or child. The third temptation is to kill some public character, politician, champion walker, or any one who happens to be prominently before the public and excites the emotional nature. When any person without a confederate kills or attempts to kill the President of the United States or the Queen of England, the presumption is a thousand to one that he is crazy.

Dr. Beard then went on to give, by means of his four tests of *sanity*, the differential diagnosis between fanaticism and insanity, between genius and insanity, between vice and insanity. Dr.

Beard read an unpublished letter, which had just come into his possession. It was from Guiteau, in response to a letter from his brother asking whether he would like him with him during his last hours. By Dr. Beard's four tests of *sanity* it was shown that a part of this letter was enough upon which to rest a diagnosis of insanity, and by these tests he was able to declare that Guiteau had been insane for more than twenty years. Dr. Beard drew a distinction between Jesse James, James Fisk, J. Gould, and Sindram, men who were simply vicious and depraved, and men like Guiteau and McLean, who were crazy.

There being no discussion on Dr. Beard's paper, Dr. James J. PUTNAM, of Boston, read a paper, the title of which was, "Contribution to the study of central myelitis."

The communication consisted of the clinical history and autopsy of a hospital patient, whose trouble was ushered in by a chill, three weeks before entering the hospital, followed by pneumonia; who had retention of urine for three days, attacks of vomiting; improvement, and after being in the hospital eight days died with symptoms of dysentery. Autopsy twelve hours after death showed a peculiar condition of the lungs, dark spots beneath the surface of the pleura, with irregular outlines, which were hemorrhages into the substance of the lungs. The gross appearance of the spinal cord, so far as its membranes were concerned, was normal. There was no trace of meningitis, in spite of the patient having suffered much pain. The naked-eye lesions of the cord consisted of evidences of subacute inflammation along its entire length in the central anterior cornua.

The case was further interesting as showing the extent of improvement possible while active changes were still going on. It afforded an opportunity of referring to Dr. Ross' views, who thinks that the spinal cord should be divided into fundamental and accessory portions, the latter being situated in the central portion of the anterior cornua, and also in the peripheral portion of the great group of ganglionic cells which lie about the periphery of the anterior cornua. These parts he considers are especially prone to inflammation, in the proportion that recently acquired movements are lost more quickly than those which have been long acquired.

Remarks on Dr. Putnam's Paper.

Dr. F. T. MILES, of Baltimore, inquired if examination as to tendon reflex was made.

Dr. PUTNAM replied that it was absent.

Dr. MILES thought this was one of the most interesting points to determine as to whether the disease was in the central or peripheral parts of the cord ; there was no doubt but that they merged into each other. Nevertheless, for the matter of prognosis it was of importance to make a distinction as far as possible. In cases of neuritis we lost the tendon reflex and ankle clonus ; in cases of myelitis these were exaggerated. In cases of multiple neuritis the diagnosis is based upon faradic contractility. Retention of the bladder and rectum are seldom implicated ; there is loss of ankle clonus and tendon reflex. It is true that the tendon reflex is lost in poliomyelitis anterior, but here we ought not to expect pain.

Dr. PUTNAM remarked that it was just this question of pain which puzzled him. He was struck with the prominent symptom, pain, in the cases of poliomyelitis collected by Dr. Seguin. He thought it remained for future investigation to determine whether the peripheral nerves were first involved, and the affection of the anterior cornua secondarily. He had made no record of the faradic reaction. The atrophy was very considerable, but not as great as we sometimes meet it. The loss of power first extended nearly over the whole body, but afterward it was confined almost entirely to the right arm.

Dr. BEARD asked if the observations upon the case reported were not in harmony with Dr. Ross' views.

Dr. PUTNAM was not prepared to say.

Dr. BEARD remarked that Dr. Ross, following Herbert Spencer, had applied the theory of evolution to the spinal cord, as he (Dr. Beard) had, in his paper, just read, applied it to mental symptoms.

Dr. PUTNAM supposed none would doubt that there was a law of evolution, but its precise application in disease of the spinal cord was not yet determined.

Dr. WEBBER, of Boston, said the case reported supported Ross' theory more largely than he at first supposed. Where recovery took place to such an extent as in this instance, it would be interesting to observe whether any young cells were present.

Dr. SEGUIN inquired if there were any vacuole cells.

Dr. PUTNAM replied that a certain number were present. In reply to Dr. Webber's question he would call attention to a case reported recently, where recovery took place to a considerable extent while the lesion constantly increased, and in which no particular signs of restoration were present, from which the conclusion was drawn, that, up to a certain extent, the functions of parts may be maintained with a much more limited number of elements than ordinarily used.

There was no further discussion. Dr. E. C. SEGUIN read a short history of a "Case of injury to the motor area of the brain," with exhibition of the patient.

Wm. M. Gates, æt. 27, Middletown Springs, Vt. Dr. Middleton Goldsmith. Nine years ago struck by a stone just above right ear. Was senseless. Pt. says he could walk when he came to, but could not use left arm; claims that he could not move any portion of arm or hand. Could talk. Not much trouble from wound, but at the end became unconscious and had a convulsion.

Dr. Thomas was then called. Was convulsed generally, and had a depressed wound above the right ear; perhaps a little paralyzed, and leg was a little weak, but the palsy of arm was complete. Several repeated spasms; was bled for convulsions, but no operation was performed, no bone ever came away; several months before wound healed. Had other convulsions in a week, then very frequently, daily, several a day, sometimes a week without attack; once was three weeks without attack. Seizures now quite frequent; also has petit-mal, and in this perhaps the hand is stiffish. No evidence of nocturnal attacks.

Marked analgesia of hand and fingers, though he says he feels contact of objects, and pin going through.

Hand very athetoid; was contractive in flexion for quite a while after wound, time uncertain; limber for 4-5 years.

The man's head exhibits a rounded, saucer-shaped depression in the middle of the right parietal bone. The lower edge of the cicatrix is eleven centimetres above the apex of the tragus, and its upper edge five centimetres from the median. From the nasal spine to the anterior edge of the scar is sixteen centimetres. The diameter of the depressed area is between three and four centimetres, and its greatest apparent depth about eight millimetres. It is firm and bony throughout. Projecting the lines of Broca on the head the scar is found just anterior to the Rolandic line, overlying the middle of the ascending frontal gyrus.

The patient was examined by several members who expressed the opinion that the man's epilepsy might be cured by the proposed operation of trephining.

Dr. HAMMOND remarked he had now operated thirty-one times, and with gratifying results in many cases.

Upon motion the Association adjourned until 8:30 P.M.

First day, evening session.

The President, Dr. HAMMOND, called the Association to order at 8:30 P. M.

Present—Drs. Amidon, Bannister, Edes, Gibney, W. A. Hammond, G. M. Hammond, Miles, Mills, Morton, Ott, Putnam, Rockwell, Seguin, Shaw, Spitzka, and Webber.

The Secretary read the minutes of the afternoon session, which were approved.

Dr. Miles was requested to take the chair, while the President, Dr. HAMMOND, read his paper, entitled, "On the so-called family or hereditary form of locomotor ataxia."

Twenty years ago, when doubt existed relative to the seat and nature of the lesion constituting the disease now generally known as locomotor ataxia, Friedreich, of Heidelberg published an elaborate essay, of which the title, "On degenerative atrophy of the posterior columns of the spinal cord," indicated the view which he entertained of its morbid anatomy.

All writers had, so far as Dr. Hammond knew, accepted, without question, Friedreich's view of their character, while no one had thought it worth while to study them in the light of our present knowledge.

Some of the details of Friedreich's six cases were then given. Dr. Hammond said no neurologist of the present day, after a full consideration of these cases, would regard them as instances of locomotor ataxia. That they have been so regarded by competent authority can only be explained upon the hypothesis that they have not been thoroughly studied, and that one writer has accepted the statements of another without referring to the original source.

In every one of Friedreich's cases the first symptom observed was weakness of the lower extremities, which gradually extended so as to involve the upper extremities. We find also that in no single case, at any period of its course, was there the slightest loss of cutaneous or muscular sensibility. In no case was there any derangement of the excretion of urine.

Dr. Hammond thought when, as in Friedreich's cases, the lancinating pains are not invariably met with—in fact, being very rare,—when there is no swaying of the body on closure of the eyes, when the inevitable result is that the morbid process extends upward, that the speech becomes affected, that the pupils are always equal, not contracted, and reacting perfectly to light, we have an *ensemble* of symptoms which are absolutely incompatible

with the idea of primary degeneration in any part of the posterior columns of the cord.

In a subsequent paper Friedreich brings forward three other cases with similar features and occurring in sisters. He states that in one of these cases, the patient dying of typhus, the principal features revealed at the *post-mortem* were the facts that the posterior columns of the cord (the columns of Burdach and the columns of Goll) were in a state of sclerosis, and that the like condition existed in the medulla oblongata. Reference was also made to the cases of Carre.

Dr. Hammond reported in full the histories of twelve cases similar to those of Friedreich, which had come under his own observation. These examples of the disease all occurred in children. All were healthy up to the time of the appearance of the paralysis. Parents normally healthy. The disease begins with weakness in the lower extremities, and then gradually advances upward, with nearly complete freedom from pain. In none were there the peculiar sharp, lancinating, electric-like pains met with in locomotor ataxia. The pupils, when observed, were equal and normal in size and reaction. In all, the speech was involved in a peculiar manner.

It was the rarest phenomenon to find the pupils unaffected in locomotor ataxia when the lesion was situated in the upper region of the cord. It was also exceedingly rare to meet with speech derangements, and there was always cutaneous anæsthesia at some time or other in locomotor ataxia. In the latter disease there is almost invariably impairment of the contractile power of the bladder, or its sphincter, or both.

The gait of these children was altogether different from that of ataxics. Instead of the feet being put down with a jerk and in two distinct movements, they were moved exactly like those of a drunken man when he attempts to walk.

For these reasons, Dr. Hammond could not consider the cases in question to be instances of locomotor ataxia or sclerosis of the columns of Burdach. Doubtless, in some of them, these columns were involved, but it was in all such clearly a secondary phenomenon.

In the absence of sufficient *post-mortem* evidence, Dr. Hammond hesitated to assign a locality to the lesion which constitutes the pathological entity of the cases to which he had referred. He was inclined to think, however, that its primary seat is the medulla oblongata. This opinion was mainly based on a careful consideration of the symptoms.

Remarks on Dr. Hammond's Paper.

Dr. E. C. SEGUIN remarked that it had been his good-fortune to meet with quite a number of cases (at least a dozen) of this kind, of which he had notes. They had occurred in families, groups varying from one to three.

Some years ago he had a call from a patient who came to his clinic at the College of Physicians and Surgeons, in whom he made the diagnosis of disseminated sclerosis. This patient said his brother suffered similarly, being completely paralyzed in his lower limbs, and drawn about the streets of New York as a beggar. It was also learned that a sister had died at the age of thirty or thirty-two years, after having suffered for years in a like manner to that described by Dr. Hammond. Since January, of this year, he had seen a case from Morrisania, which was characterized by thick speech and difficulty in the movements of the legs and arms. The father described another child of the same family affected in like manner.

Dr. Seguin had seen a case in St. Luke's Hospital in which the symptoms were those of locomotor ataxia, except, that the speech was affected, and there was an increase of the tendon reflex. Upon these two symptoms he based the diagnosis of disseminated or nodular sclerosis. He had always understood Friedreich's cases, and in referring to them had taken pains to mention that they were cases of more or less disseminated sclerosis of the spinal cord. The same was true of Carre's case. He referred to a case which was supposed to belong to this class, in which he found disseminated spinal sclerosis clearly shown, but whether the child had at a previous period presented ataxic or paretic symptoms he could not say. Nystagmus, imperfection of speech, ataxia, and yet absence of pains, anæsthesia, and the peculiar iris symptom which we expect in post-spinal sclerosis, were characteristic of these cases.

Dr. A. D. ROCKWELL recalled to mind a case which simulated ataxia, and which the President and he had seen together some years ago. A brother of this patient had an affection of the eyes, and was now nearly blind. Another brother had difficulty in co-ordinating the movements of his hands and feet; and the son of the latter was the subject of excruciating sick headache.

Dr. W. J. MORTON would like to inquire how commonly the disease under consideration occurred in adults, in Dr. Hammond's experience. He had seen a case which exactly fitted Dr. Ham-

mond's description, which had been referred to him as one of locomotor ataxia, but which he felt obliged to diagnose as disseminated spinal sclerosis. The patient was a woman of twenty-five years of age, and had been affected some five years. She had no lack of cutaneous sensibility, no bladder symptoms, no ataxia with her eyes closed, but merely a staggering walk. There was slight nystagmus, and slight difficulty of speech.

Dr. HAMMOND said the objection to considering these cases, disseminated sclerosis, was that tremor was absent upon attempting voluntary motion. When the lesion was confined to the spinal cord there was always present tremor when the patient attempted voluntary movements. In the cases which he had seen there was no tremor, no agitation of the muscles accompanying voluntary motion.

In answer to Dr. Morton's question, he thought the patient referred to, might have been affected sufficiently early in life, to allow of classifying it among such cases as he had brought forward.

Dr. S. G. WEBBER, of Boston, thought he had heard of cases similar to those reported by Dr. Hammond. A brother of several sisters came to consult him about the advisability of bringing one of his sisters to see him, and on this occasion gave Dr. Webber an account of the whole family. One of the sisters had already died; another was so sick and feeble that it was thought she was past help; and a third, a younger sister, was in the early stage of the disease. The symptoms of all, as nearly as could be remembered, corresponded to those described by the author of this paper. A friend of Dr. Webber's told him of a family of four or more children, who, as they became of a certain age, were attacked by the disease, and finally died of it—so, in that town, the disease acquired the name of this particular family.

As to patients with disseminated sclerosis being affected with tremor upon voluntary motion, he would say that he had a case some three or four years ago, which he diagnosed as locomotor ataxia, in which there was no tremor. There was a staggering gait, pain, and inco-ordination.

The patient died three months later with an acute disease, and the *post-mortem* showed disseminated sclerosis, but in the upper lumbar region the posterior columns were sclerosed. In the brain and medulla oblongata were quite a number of patches of sclerosis. When Dr. Webber saw the case there was positively no tremor on voluntary motion. He thought tremor was not so common.

Dr. SEGUIN was glad that Dr. Webber made that remark; he arose to make a similar one. His experience had shown him that all other symptoms might be present without tremor. He would remind Dr. Hammond of Charcot's peculiar experience two years ago, who had a case in his ward that was tetanized, and which he referred to as a case of sclerosis of the lateral columns. He was afterward obliged to publish it as a case of disseminated sclerosis. That such was what must be the case, it seemed to Dr. Seguin, if we considered the pathological anatomy of nodular sclerosis, as he called it, for the nodules were scattered throughout the cerebro-spinal axis. In ataxic cases we recognize nodules in the posterior columns. So we can sometimes recognize them in the anterior columns. If the nodules are more anterior the paralytic condition and quasi-ataxic state are the predominant symptoms. If the lesions are more in the lateral columns the symptoms may imitate primary lateral sclerosis.

Dr. PUTNAM had seen the two young women referred to; they were about 15 and 18 years of age, and were living in Boston. He had seen two other exceedingly interesting cases of this kind. He referred to two girls affected very much in the same way, but the condition reminds one more of typical disseminated sclerosis. His impression was that Leyden had noted these cases as examples of arrest of development.

Dr. HAMMOND said that the trouble came on after birth, and that there was no reason why there should be an arrest of development at this age in order to account for the symptoms. He was glad that the universal sentiment of the Association was that they were not cases of locomotor ataxia.

There being no further discussion, Dr. H. M. BANNISTER, of Chicago, read a short paper entitled, "Note on bromide mania, and the supposed compensatory action of epileptic attacks."

He recalled the fact that he had read a paper on mania last year before the Association, in which he made the query whether the excitement was due to the suppression of fits rather than to the medicine. In the discussion that followed Dr. Spitzka referred to former observations of some phenomena by Dr. Stark. By reference to these, Dr. Bannister found that he (Dr. Stark) commits himself to the view that the excitement is due to the suppression of fits.

On the other hand Dr. Hammond had noticed cases which, not being epileptics, could not be accounted for on the theory of Dr.

Stark. Dr. Bannister then gave the history of a case in which the fits were suppressed by bromides, with the result of producing maniacal excitement which subsided upon the discontinuance of the medicine. It was found, however, that they could be completely controlled and the general condition of the patient much improved by the administration of a one-per-cent. solution of nitro-glycerine. As long as his observations were continued these facts were observed, and the case was conclusive, as fully as one case could be, that the mania was due to the medicine rather than the suppression of the fits. Details of other cases were given. The paper was offered as a supplementary note to the former paper above referred to.

Remarks on Dr. Bannister's Paper.

Dr. SPITZKA remarked that if he understood the reader of the paper correctly he stated that the fits being suppressed by other remedies than the bromides and without the occurrence of maniacal attacks, was evidence that the excitement was due to the bromides, and that Dr. Stark's observation was negated. He would be inclined to follow Dr. Bannister had he not encountered examples of the difficulty of making conclusions from a few cases. The case of an imbecile had come under his observation about two years previous; the saliva dribbled from the patient's mouth, in which condition he had been for months; he had maniacal attacks for 18 months. The patient was sent to an asylum under the idea that his epilepsy could never be cured and that he could never recover his mental condition. To the great surprise of Dr. Spitzka the patient was returned from a pauper asylum where he had no treatment whatever that could be called treatment. The patient had improved so much that it was considered no longer necessary to retain him. The fact that a certain group of epileptics experience a relief after a certain time seemed to show that there was some ground for Stark's conclusion.

Dr. BANNISTER remarked that the case was considered conclusive only so far as one case could be so considered.

Dr. SEGUIN stated that Schroeder van der Kalk calls attention to the same fact referred to in Dr. Bannister's communication and that his view was that the attack is in the nature of a discharge.

Dr. MILLS thought that it was important in considering a matter of this kind to very clearly differentiate hystero-epilepsy from epilepsy. There is a status hystero-epilepticus as well as an epileptic

status. The bromides do badly in hystero-epilepsy. With reference to the occurrence of mental disturbances in epileptics in consequence of the use of the bromides, his experience has been that we have at least three distinct conditions as regards epileptics. We have a pre-paroxysmal condition, a post-paroxysmal condition, and the distinct substitution of an epileptic attack by a maniacal attack. He would say on the whole that the more frequent the fits and severe the attack the more likely are patients to have maniacal excitement. He had in the wards of a hospital in Philadelphia a number of patients under the bromide treatment, who had been taking the remedy for months, and in very few instances had he seen bad effects from their use. He recalled one patient who came to the hospital and who was brought back on several occasions because of the maniacal attacks following paroxysms.

Dr. BANNISTER would say that there was no suspicion of hystero-epilepsy in the case reported by him.

"A contribution to the clinical study of arsenical myelitis," was the title of a paper by Dr. E. C. SEGUIN, of New York. The cases reported were a rare sequel of Paris-green poisoning. The author regretted that he had been unable to inquire into the literature of the subject, but believed it was scanty.

Detailed histories of three cases which had come under the author's observation were given. These cases all recovered. All three cases presented evidences of slight subacute myelitis, more distributed in the anterior cornua. In Case 1 the symptoms were more purely those of polio-myelitis. In all cases the symptoms of myelitis followed within a week after the ingestion of the poison. Whether the myelitis was caused by the direct action of the arsenite of copper upon the spinal cord, or whether it arose as a result of irritation of the nerves of the stomach and intestines, was the important question which Dr. Seguin wished discussed by the Association.

Remarks on Dr. Seguin's Paper.

President HAMMOND inquired if the poisoning was due to copper or arsenic, and referred to some experiments by a Frenchman who had found similar results from poisoning by copper.

Dr. SEGUIN's impression was that the effects reported were due to arsenical poisoning. Though he would not wish to use the cases as data for a theory, it appeared from them that the mye-

litis had resulted from the irritation of the gastro-intestinal track.

Dr. AMIDON wished to call attention to the similarity of these cases of paralysis to those of spinal cord paralysis following diphtheria. In two of the cases reported, the paralysis resulting from the poisoning was excessive. It had always seemed to him that the pathology of these cases and that of spinal cord paralysis following diphtheria were similar.

Dr. SEGUIN remarked that most of his cases of diphtheritic paralysis had shown an ataxic stage previous to the paralytic stage. They had no tendon reflex, no pains ; but the history of diphtheria was clear. He thought he had seen some cases in which the ataxic stage was absent.

Dr. MILES thought that it was not impossible that cases like those reported by Dr. Seguin might result from general diffuse neuritis. In certain cases of diphtheritic paralysis he had found *post-mortem* evidences of disease of the nerves. He could mention cases that presented all the symptoms referred to, where no toxic substance was taken, and where there was only exposure to cold. He referred to the case of a man whose first symptom was tingling in the lower limbs, which passed upward and gradually involved the whole body, until he was not able to move a single limb. Atrophy of the muscles occurred to an extreme degree, and there was loss of faradic contractility. Complete recovery took place in a short time.

Dr. PUTNAM inquired if any other facts led to the suspicion that the condition was due to intestinal trouble. Also if it was possible for paralysis to occur in consequence of a single large dose of copper. He had seen one such case in which recovery took place.

Dr. SEGUIN replied that he believed he stated that he was not willing to advance a theory based upon the three cases reported. They all had gastric irritation, as he supposed was the rule in cases of Paris-green poisoning. It seemed that irritation of the mucous membrane and nerves might have led to the production of myelitis in a manner similar to the production of that condition by cold from exposure, or by the application of cold to the surface of the body.

Dr. HAMMOND said that he had asked Dr. Seguin whether the poisoning was due to arsenic or copper, for the reason that 18 months ago he had a similar case where the poisoning was clearly due to copper. He had prescribed the ammonio-sulphate, with di-

rections to take $\frac{1}{2}$ of a grain. Instead of taking the number of drops ordered the patient took an equal number of teaspoonfuls. Paralysis of all the muscles of the body, except those of respiration, followed. She remained in that condition 72 or 80 hours, and then gradually recovered. There was absolute want of sensibility. The patient took about 20 grains of the ammonio-sulphate of copper.

The next paper was read by Dr. WM. J. MORTON, of New York: "Mechanical vibration for the relief of pain. A new percuteur."

Next to the anæsthetics and narcotics, revulsion or counterirritation has long held a prominent place in the treatment of pain.

The general law which governs the relief of pain by counterirritation has been recently formulated by M. Brown-Séquard, who, after careful experimentation, announced the general principle, that general and local anæsthesia could be produced in the lower animals by applying to their peripheral nerve distribution a strong counterirritant, like a few drops of chloroform, and that this anæsthesia was explicable on the theory of inhibitory action. A drop of chloroform on a Guinea pig's neck produced general anæsthesia. Here was an explanation of counterirritative procedures in medicine. It requires little imagination to figure the time when a certain localized and known peripheral area of the human skin may be counterirritated in order to produce an inhibition of pain in some spot far distant. At present the counterirritation is applied as near as may be to the seat of pain. Undoubtedly many of the cures or reliefs that are effected by general peripheral treatment, like slapping, rubbing, stroking with the hand, general applications of electricity, etc., are due to impressions produced upon the fine peripheral network of the sensitive nerves, and conveyed to centres which set up inhibitory or relief responses, in their turn curative.

Within a few years other and more delicate methods of affecting the sensitive peripheral network of nerves have been brought forward under the general term—æsthesiogenic agents. This work has emanated from the clinic of Prof. Charcot, and has been elucidated mainly by Dr. Vigouroux. The latter gentleman enclosed an arm in a thin wooden box, surmounted by a tuning-fork kept in vibration, and found that the arm was rendered anæsthetic.

Hypothetically all forms of force display themselves in vibrations: heat, light, sound. Nerve force, whatever its nature is,

is probably vibratile. And herein, theoretically, probably lies the explanation of the effects we have alluded to. A vibration different to the vibration existing in the nerve, whether healthy or diseased, is set up by the external agency employed.

There is a form of vibration, not yet alluded to, which is communicated directly from the vibrating agency to the part to be treated. This may properly be called mechanical vibration, and it was that to which Dr. Morton wished particularly to call attention. To Dr. Mortimer Granville, of London, is due priority of treatment by this method; while to Dr. Vigouroux, of Paris, we owe theoretical studies, and the practical extension of Granville's ideas.

A new percuteur.—Dr. Morton, in his instrument, has arrived at a mechanism which would have a more powerful stroke than Granville's clock-work percuteur and the dental hammer, and at the same time give less trouble than the tuning-fork percuteur, which requires the use of a small galvanic battery. His instrument involves the idea of applying the vibrating rod directly to revolving hammers actuated by a crank movement.

The instrument was small, light, and could be readily applied to any part of the body.

Granville's hypothesis of the action of percuteurs is, that sharp pains are represented by rapid vibrations of neurility, and that "boring" and "grinding" pains are represented by comparatively slow vibrations. Consequently, in order to break up either one or the other forms of pain, it is necessary "to set up a new set of vibrations, which shall interrupt or change the morbid set by introducing discord."

Remarks on Dr. Morton's Paper.

Dr. WEBBER inquired if it would not be advisable to have different-sized discs with which to percuss upon the surface of the body.

Dr. MORTON said that it would and that he was now having them made, together with a number of other minor improvements which would materially enhance the utility of the percuteur.

Dr. Mierzejewski, of St. Petersburg, and Dr. Auguste Ollivier, of Paris, were nominated honorary members by Drs. SEGUIN and AMIDON.

Second day, afternoon session.

President HAMMOND called the Association to order at 2:30 P.M.

Present—Drs. Amidon, Bannister, Birdsall, Edes, Gibney, G. M. Hammond, W. A. Hammond, McBride, Miles, Mills, Morton, Ott, Putnam, Rockwell, Seguin, Sinkler, and Webber.

The Secretary read the minutes of the previous session, which were approved.

The Secretary made a statement to the effect that he had received some photographs from Dr. J. J. Mason, and a paper by Dr. Schmidt, of New Orleans, with illustrations upon a tumor of the fourth ventricle. He had also received a note from Dr. Jewell, of Chicago, who stated that on account of ill-health he could not be present during the meeting.

Dr. J. J. PUTNAM, of Boston, first exhibited two instruments.

The first instrument was a little microtome especially devised for the purpose of cutting spinal-cord sections and to be held in the hand. It could be used for other purposes; it avoided the necessity of imbedding the specimen.

The other instrument was a modification of Pond's sphygmograph. The essential point of difference between it and the original is, that means is afforded for regulating the pressure upon the pulse. He had also added a counterpoise for holding the point in place.

President HAMMOND thought the modification of great value. He had been unable to use with satisfaction Pond's instrument.

Dr. S. G. WEBBER, of Boston, read a paper entitled "Lead paralysis."

The object of the paper was to present a few cases of lead paralysis, not for the purpose of discussing all the questions which naturally occur to one in connection with the subject, but for the purpose of a brief review of the theories of its pathogenesis, and secondly, to call attention to some unusual forms in which lead poisoning may show itself, simulating more serious lesion.

There are two views now most prevalent in regard to the seat of the lesion in lead paralysis. Some authors consider the central nervous system, the spinal cord and brain, to be the parts primarily affected, viz. : Erb, E. Remak, Eulenberg, Monakow, Bernhardt, and de Wetteville. Westphal, Leyder, Lunker, Gombault, Charcot, favor another view, that the primary seat of the disease is in the nerve.

The evidence obtained by a number of authorities which were quoted, from *post-mortem* examination, Dr. Webber said would be conclusive that lead paralysis does not depend upon lesion of the cord ; but objection has been raised that it requires only a very limited lesion in the cord to give rise to the symptoms observed, and it is said that the examinations have not been complete. Three observers had found the cord diseased. C. v. Monakow had reported a case which was of more than usual interest, and was very significant that there was lesion in the brain, the cord, and the nerves ; the location of the lesions was such that the changes in the cord could not be secondary to the changes found in the brain ; and as the distal ends of the nerves were more affected than the proximal portions—the roots were not diseased,—it is not probable that the changes in the nerves depended on those found in the spinal cord. Monakow concludes that the origin of the affection is to be sought in the spinal cord, though recognizing that there are difficulties in this view from the absence of changes in the radial nerve near the cord and in the nerve root.

The author of the paper stated that we had as yet no proof that the higher centres, as brain or cord, can cause lesion of distant parts of the nervous system, as nerve or cord, without a continuous track of degenerated tissue intervening. Such a relation may, in the future, be shown to exist, but at present it is not proven. On the other hand there are a few facts, as experiments on animals, the changes in tetanus and hydrophobia, which tend to show that the peripheral nerve may exert an injurious influence upon the nutrition of the cord, even when the intervening parts of the nerve are apparently unaltered. In lead paralysis the mass of evidence derived from pathological anatomy would show that the disease is primarily a neuritis unless the origin by separate and independent centres is accepted as the true explanation. The fact that many cases of lead paralysis recover is also in favor of the peripheral rather than the central origin of the disease.

Dr. Webber could not believe that the spinal cord is the primary cause of the atrophy in cases like those which he reported. Most of the examination of nerves and muscles in lead paralysis show that the nuclei still persist long after paralysis has shown itself ; from these nuclei may be developed the new structures which take their part finally in restoring the normal functions of the limbs. The fact that so many observers find the spinal cord intact may encourage us to give a favorable prognosis.

Another important fact which he had observed was that either pain, more or less severe, or soreness, or a tingling sensation preceded the motor disturbance.

In only one of the four cases reported could the origin of the lead be discovered. This is perhaps not strange in view of the results obtained by A. Gautier, who examined different articles of food and found lead in preserved vegetables, fish, crustacea, meats; also in drinks and drinking water, and the water artificially charged with carbonic acid; in acid drinks and condiments put up in brass; in vessels and utensils of tin, in the glazing of the walls and furniture, the woolen and silk of our clothing, the leather of our shoes, enamelled cloth; in the oil in which sardines are put up he found a relatively large proportion of lead.

Remarks on Dr. Webber's Paper.

Dr. PUTNAM remarked that he had seen two cases, one of which he was sure Dr. Webber referred to, which would never have been thought to be cases of lead paralysis. One of these resembled lateral sclerosis, and the other myelitis exanæmia. The first one recovered.

Dr. WEBBER inquired if Dr. Putnam had made the examinations of the urine of healthy patients for lead as he intended doing.

Dr. PUTNAM replied that he had not.

Dr. MCBRIDE inquired what tests for lead were used.

Dr. WEBBER replied that the tests were made by Prof. Wood, of Harvard, and he thought there could be no suspicion as to their accuracy.

Dr. SEGUIN had in mind a case in which the symptoms of lead paralysis were absolutely identical with those of poliomyelitis. He referred to the poisoning of a lady, the wife of a member of the Geological Survey Corps, who had imbibed lead in Washington. The reactions were characteristic of degeneration. There were marked anæmia and some dementia. Her urine was examined in Washington and afterward by Prof. Wood, of Harvard, and on both occasions lead was found. This case was one of a number which he had seen, and in which he would defy any neurologist to make a diagnosis between poliomyelitis and lead paralysis. The symptoms, he claimed, even of limited lead paralysis were identical with atrophic paralysis with pain. The reaction in lead paralysis, whether limited or general, was identical to those in poliomyelitis. The course of the disease is similar, and the

course of treatment adopted is similar ; we give iodide of potassium in nearly all cases. In cases of drop-wrist he had administered iodide of potassium. There are few cases on record with lesion. He was unwilling to give up the idea that lead paralysis, whether localized or disseminated, is a form of poliomyelitis.

Dr. WEBBER wished to say one or two words in regard to the pathology. It seemed to him that it was still undecided, and yet he thought in many of the cases, as he stated in his paper, neuritis would explain the symptoms. The affection, he thought, began in the nerves and minuter nerve branches running to the muscles. He thought that autopsies made by such careful observers, and in which no lesion was found, was sufficient ground for granting that we may have lead paralysis without lesion of the spinal cord.

Dr. MILES spoke of the pains in the adult, and of their absence in the child.

Dr. SEGUIN thought that Dr. Miles assumed something that is not yet proven. These children were very young and might have pain.

Dr. MILES said that that was true, but that the best authorities agreed that such was not the case.

Dr. BIRDSALL said he had the opportunity of examining a case already published that bore upon the point made by the reader of the paper. He thought when we considered how often this disease is not serious, we would admit that we might have changes in the cord not sufficient to produce apparent lesion. In his experience he had found the electrical reaction present in a very limited form. The true reversal of the formula of galvanic reaction is not as frequent as in ordinary myelitis of the anterior horns. It seemed to him, in a certain number of cases, that we might have some functional impairment without any lesion in the spinal cord. He was aware, that in some cases lesions were not found in the spinal cord, but were present in the muscles and nerves. These peripheral changes might, after all, be the evidences of central impairment. It seemed to him, that, the cutting off of activity of the cord, might be made manifest in the periphery. Of course this is only theoretical. It seemed to him, that in the majority of cases, the probabilities were that the central parts were primarily affected and the peripheral parts secondarily.

Dr. GIBNEY did not believe that children suffering from poliomyelitis anterior were free from pain, as said by Dr. Miles. He

saw a great many cases, and the mothers of most of them reported that they cried and could not handle their limbs. The reason why Dr. Miles and most neurologists did not know this fact was probably because they came in contact with only a few cases occurring in children. During the inflammatory stage he was quite sure they did have pain. The cries of these children were indicative of pain; the limbs were sensitive, and it was almost impossible to test the muscles.

Dr. W. SINKLER, of Philadelphia, believed that a large number of cases were central in origin.

Dr. WEBBER thought the lesion arose in different parts independently. In one of the cases, the brain, spinal cord, and nerves were affected. There were three distinct seats of lesion, but not connected by tracks of degenerated tissue. He thought the explanation was to be found in the idea that irritation was produced in the several parts by lead. In the kidneys we have the symptoms of albuminuria. In reality, lead paralysis is simply one manifestation of a general diathesis and of changes which may occur in other parts of the body. Bones have been affected by lead poisoning.

President HAMMOND had for a long time entertained the opinion that the original lesion was central, but now experience had convinced him that the original lesion is in the nerve. Within the last five years he had three cases of lead paralysis in left-handed painters, who were paralyzed in the left hand. Usually, the patients are right-handed, and the paralysis is in the right hand. He thought such cases were to be explained on the ground of actual contact with lead. He would like to ask for the manifestations of lead poisoning when taken into the stomach and when used locally. He cited instances of lead poisoning occurring in persons who colored their hair with dye containing lead, which affected the scalp directly. In regard to Dr. McBride's question, he would say that lead was not usually secreted except when taking iodide of potassium. A very easy test was the galvanic.

Dr. EDES thought there were other explanations of lead paralysis; he thought that painters got poisoned through their lungs or alimentary canal. He saw one case of lead paralysis which he considered to be general. He thought that, in lead paralysis as in writer's paralysis, those muscles were affected which were most used. He alluded to one case of lead encephalopathy where the autopsy showed no gross lesion, but Dr. Wood found a good deal of lead in the brain. The patient was an ordinary lead worker.

He remembered another case, that of a printer : while it might be supposed that the lead was absorbed through the hands, but the patient testified to the habit of holding the type with his teeth.

President HAMMOND still maintained his idea of the local absorption of lead, notwithstanding the examples of lead paralysis occurring in printers, cited by Dr. Edes. It was possible to explain such cases in two ways, but in lead paralysis due to hair dye it could not be asserted that women habitually drank their hair dye.

Dr. CHARLES K. MILLS, of Philadelphia, read a paper entitled "Clinical notes on twelve cases of brain tumor, chiefly with reference to diagnosis."

The notes presented were on twelve cases of intracranial tumor in which the clinical examinations and the autopsies had been made by Dr. Mills. The notes were arranged so as to give a very much condensed clinical history, and statement of the gross *post-mortem* appearances and the results of microscopical examinations. The facts thus presented were then summarized and conclusions drawn.

Headache, usually described as persistent pain of considerable severity, with exacerbations of great violence, was present in every case. In several instances the patients complained of the pain being greatest in the region of the head nearest the seat of the growth. Percussion of the head elicited or intensified pain in the cranial region, beneath which the lesion was localized in three out of four cases examined in this way.

Vomiting was a symptom in eight of the twelve cases. In a case of tumor of the cerebellum, so located as to cause irritation of the floor of the fourth ventricle, vomiting was persistent. In most of the cases the vomiting was ascribed to irradiation of irritation of the nerves of the cerebral membranes, the observer agreeing with Ferrier in reference to this point.

Vertigo was noted in ten cases, most marked in two cases of cerebellar tumor.

In Cases 4, 5, and 6 the tumors were located in the motor region of the convexity, and in each case an accurate local diagnosis was made during life. The symptoms characteristic of tumors in the motor zone of the hemispheres, as given by Seguin, are : localized convulsions in peripheral muscles ; equally localized paralysis of peripheral parts ; neuro-retinitis or choked disc ; localized headache. (The *Medical Record*, Feb. 26, 1881.) To

these should be added pain elicited by percussion of the head in the neighborhood of the growth, and elevated surface temperature of the head, particularly over the locality of the tumor.

In studying the symptoms presented by cases of brain tumor, the clinician should never lose sight of the fact that tumors of any size invariably occasion a considerable amount of softening by obliterating vessels in their process of growth. Large foci or layers of softening were found in nearly all the cases. In others true abscesses were present.

More or less anæsthesia or impaired sensibility was present in seven cases. In one case, in which the tumor was situated in front of the optic chiasm, the diminution of sensibility in the left leg was probably the effect of remote pressure.

In a case of tumor of the motor zone, left hemianæsthesia, complete before death, was present. The anæsthesia was here doubtless due to the softening which accompanied the tumor, and involved the posterior portion of the lenticular nucleus and internal capsule and adjoining regions of the corona radiata.

In a similar case, with softening of the white matter of the parieto-temporal region ; in an occipito-parietal tumor, with softening of the occipito-parietal white matter ; in a tumor and abscess of the temporal lobe ; in a case of cerebellar tumor, but with softening also of the posterior portion of the internal capsule and small adjoining parts of the optic thalamus and lenticular nucleus, partial hemianæsthesia of the side opposite to the lesion was present.

Where anæsthesia is complete, or nearly complete, Dr. Mills thought the problem is a simple one, and a definite lesion to account for the symptom could be expected ; partial anæsthesia is sometimes apparent rather than real. He had frequently observed in patients suffering from motor paralysis, and in which autopsy had shown a lesion limited to a motor area, that sensibility was apparently blunted, or that, at least, the patients did not quickly respond to stimuli applied to the skin. It may be in such cases, as Ferrier has suggested, that the slow response is not because the patient does not feel, but because his volitional power is impaired.

Inflammatory, trophic, and anæsthetic phenomena in the eye were present in two cases—both in the præfrontal regions. They were most marked in the case in which the growth was near the optic chiasm.

In eight of the twelve cases ophthalmoscopic examinations were made ; in four of the eight, microscopical examinations of

the eyes and of the optic nerves were also made by Dr. E. O. Shakespeare, who had in these cases made the ophthalmoscopic examinations. In every case in which the ophthalmoscope was used, marked changes in the fundus were found. The results of the examinations gave choked discs in four cases, and descending neuritis in four cases.

Microscopical examinations were made in two of the cases of choked disc, and in two of the descending neuritis cases. Dr. Mills held to the distinction made by Allbutt and others, regarding those cases as examples of choked discs, in which the ophthalmoscope revealed great intra-ocular swelling; and those as descending neuritis, in which there was marked inflammation with little or no swelling.

The temperature of the head was taken with surface thermometers in five of the twelve cases (1, 3, 5, 6, 7). The observations taken on Cases 1 and 3 have been published in full elsewhere. *Philadelphia Medical Times*, January 18, 1879, and *New York Medical Record*, August 9, 1879. They showed considerable elevation of temperature.

In Cases 5, 6, and 7 the head temperatures were taken only once, but the observations were carefully made with tested thermometers, and gave striking results.

In Case 5, a gumma involving the motor zone of the right cerebral hemispheres, the temperatures were as follows:

Right parietal station, 97.2° .

Left parietal station, 96° .

In Case 6, a tubercular tumor involving the posterior extremities of first and second frontal and upper thirds of ascending convolutions, the temperatures were as follows:

Right frontal station, 98° .

Left frontal station, 96.3° .

In Case 7, a large growth in the postero-parietal and occipital regions, the temperatures were as follows:

Right parietal station, 98° .

Left parietal station, 97.8° .

The conclusions were that in cases of brain tumor the head temperature is elevated several degrees, and most near the seat of the growth.

Some points were made with reference to hyperæsthesia, mental disturbances, conjugate deviation of the eyes and rotation of the head, neuralgia, reflexes, constipation, respiratory and circulatory phenomena, body temperature, and hysterical manifestations.

With reference to local diagnosis, Dr. Mills concluded that the location of a brain tumor could be determined with great positiveness in the majority of cases, sometimes from a study of the active symptoms presented, and sometimes by the method of exclusion.

The general diagnosis of the existence of intracranial tumors could, he believed, be made with greater certainty, than that of any other serious encephalic disease.¹

Remarks on Dr. Mills' paper.

Dr. PUTNAM wished to ask if the author of the paper made a sharp distinction between choked disc and neuritis. Most ophthalmoscopists consider that choked disc was only a sign of neuritis.

Dr. ROCKWELL said the difficulty of arriving at a correct conclusion in intracranial diseases was impressed upon him by a case who came under his observation some time ago. The patient was a young lady about 25 years of age, who had been suffering about ten or twelve months previous from hysterical attacks, followed by epileptiform attacks. Her only mental disturbance was mental irritability and confusion of thought. There was headache present from the beginning. This finally became excruciating in character. Two symptoms, the predominance of pain and the epileptiform attack, pointed to tumor, but in the *post-mortem* examination no tumor was found. There was only opacity of the arachnoid and a few hardened patches in it. From the fact that brain tumors may exist without any positive sign, though this is not usually the case, this case was interesting because the signs of brain tumor were so positive, and yet the *post-mortem* revealed only chronic meningitis. There was no suspicion of syphilitic taint in this case.

Dr. MILES said that one difficulty in the diagnosis of tumors of the brain was in determining the character of the tumor; that is, whether it was a destructive or pressure lesion.

Dr. SEGUIN had been very much instructed by Dr. Mills' paper. He was particularly pleased with his localization views. With reference to headache, he was ready to admit that it was one of the important symptoms, and in some cases that it was almost the only symptom; that it was excruciating and peculiar. It so happened, however, that in two of his cases of well-defined cortical

¹ Dr. Mills' paper will be published in full in the *Archives of Medicine*, edited by Dr. E. C. Seguin.

sarcoma no headache was present. In the first case the symptoms began in the leg. There was no headache until one night the patient had an apoplectic attack. The lesion was situated in the para-central lobule, and in the tumor there was a cyst. There was no headache that could be attributed to the sarcoma. In the second case of sarcoma there was no headache before the appearance of definite symptoms of brain tumor, but the patient experienced occipital neuralgia.

With reference to the neuritis and choked disc, Dr. Seguin was obliged to confess that he had had a very singular experience. He had seen a number of cases of encephalic tumor and a number of cases of cerebral tumor. It had so happened that in only one case of cerebral tumor had choked disc been present. Diagrams with descriptions appended were passed around illustrating the cases referred to. All of Dr. Seguin's cases of basilar tumor had had choked discs. Also case of sarcoma within the medulla oblongata. He presented a diagram of an abscess located in the frontal lobe in which there was no paralysis and no aphasia, the symptoms being those of extreme pressure. The pulse was slow, 58, and lower at times. He presented these cases bearing upon the subject of choked disc not with the idea of lessening the importance of that symptom but with the intention of emphasizing the idea that we should not reject the diagnosis of brain tumor on account of not finding choked disc.

Dr. AMIDON mentioned the case of a man 49 years of age who had no symptoms before he was seen except occipital neuralgia. The first symptom was a weak walk, more marked in his right leg, but he very soon began to have hemi-epileptic attacks. About two months before his death the patient was seen by two homœopathic physicians, one diagnosticated anæmia of the cord and the other locomotor ataxia. Two weeks before death the attacks became very much more severe. The lesion found was in the para-central lobule and was a small cell sarcoma. At the very last the patient had aphasia.

Dr. BIRDSALL presented diagrams of a case he had described two years ago, and with it a case in which several sarcomatous tumors were found, one of which was located in the ascending frontal lobe, and accounted for all the symptoms present, namely, mono-spasm and mono-plegia in the arm. Headache, vertigo, and nausea were present; choked disc absent. No temperature tests were made. Percussion elicited pain over various portions. In the first case the tissue was simply pushed aside and not destroyed.

Dr. MILLS thought we might consider these cases decisive in regard to the great value of the ophthalmoscopic appearances in diagnosing encephalic tumors. Of course it had long been a question, and is to-day whether there is any real distinction between cases of choked disc and neuritis. His own opinion was in favor of such distinction. He was inclined to favor the so-called lymph-space theory in regard to the production of choked disc. He made his assertions with more confidence from the fact that the ophthalmoscopic examinations in his cases were made not only by himself, but by Dr. Shakespeare, and some other well-known ophthalmologists in Philadelphia. The same was true with regard to the microscopic examinations. Dr. Putnam's idea, as he took it, was that choked disc and neuritis were practically the same thing; that is, both were an inflammatory condition. Now that is true to a certain extent. The very initial process in cases of choked disc was not inflammatory but mechanical. With reference to the ophthalmoscopic examinations it is difficult to differentiate between real descending neuritis and choked disc. You will have as a rule more retinitis in the cases of descending neuritis, and less of intraocular swelling. Of course the microscopical examination, if carried backward toward the place of the tumor, will show whether the inflammation has passed up or down, or been present or absent. He could not account for the fact that in Dr. Seguin's cases choked disc was absent. With reference to headache, vomiting, and absence or presence of symptoms of this kind, he thought the generalizations would cover the exception. Tumors of the brain are in nine cases out of ten in his experience tumors of the membranes of the brain, and very usually there is a fusing of the membranes. He remembered a case of tubercular tumor in the optic thalamus in which the only symptoms were those of pressure and hemi-anæsthesia. Again, he recollected a case of glioma in which choked disc and headache were absent. Tumors, which did not involve the membranes, and which grew in such a way that they displaced the brain tissue by a slow process of absorption, would not be likely to give rise to this symptom. Headache is due to pressure or to irritation of the dura mater.

With reference to the destruction of tissue, it may have been observed that in almost every instance a certain amount of tissue was broken down back of the tumor. This is particularly the case in cortical lesions, and he thought it could hardly be otherwise. In every case of tumor of the brain the physician

should bear in mind the fact that he has not alone to deal with evidences of tumor itself, but that he has a large area of softening often, or even abscess, which will help to account for symptoms which are anomalous.

With reference to the use of chloral he had no special experience. He used morphine a great deal, and found it acted very well. One word as to hysteria, and its relation to brain tumor. He would say it was a very common complication of brain tumor. On the other hand cases of true hysteria were sometimes difficult to diagnosticate from those of brain tumor, but in hysteria you have no choked disc. Head pain is evidence of involvement of the cerebral membranes, and particularly of the dura mater. In Dr. Rockwell's case, he believed, there were some evidences of exudation and inflammation in the pia mater. He had seen some cases of chronic meningitis, in which headache was not present. He had never seen a case of pachymeningitis, in which headache was absent.

Dr. SEGUIN, with the permission of the association, made black-board illustrations of two of his cases of brain tumor. In one of the cases there was typical choked disc and excruciating pain, the lesions were in approximately similar regions, and nearly of the same size; yet in the one case there was choked disc, and in the other not. Both tumors were globular. In the first case there were arm symptoms; in the second case leg symptoms. The explanation given by Dr. Mills, he thought, depended upon irritation of the pia mater, but there was also a dynamic element apart from the location and character of the lesion.

Dr. MILLS said these two cases, he thought, bore out his ideas of the occurrence of these symptoms of brain tumor.

There being no further discussion, Dr. A. D. ROCKWELL, of New York, read a paper entitled, "A case of post-paralytic chorea, with remarks on the treatment of choreic symptoms in general."

The patient, a lad aged 8 years, was sent to him by Dr. Wm. C. Wile, of Newtown, Conn. A year previously, he suffered an attack of acute articular rheumatism, which especially affected the joints of the right side. Paralysis quickly followed, and then chorea. A year, subsequently, when he came under Dr. Rockwell's care, the patient had not improved under ordinary methods of treatment. He could not carry a glass of water to his mouth without spilling. The speech was somewhat hesitating, and the right pupil dilated. Physical examination revealed a distinct

systolic murmur, a noticeable feature of which was, that it was inconstant, disappearing, and reappearing without evident cause. The treatment in this severe and unpromising case was threefold : 1. Ether spray to the spine. 2. Fld. ext. of conium internally. 3. Central galvanization. Under these influences the boy immediately and steadily improved, and in ten (10) weeks was discharged as cured.

The reader was inclined to regard the ether spray in these chronic cases as of but little value.

Conium he had more confidence in, but in face of the numerous remedies which have successively been proclaimed to be the best, he hesitated to speak in very positive terms. As has been said of iron, strychnia, zinc, arsenic, etc., so perhaps it may be remarked of conium, "that it is the readiness with which the ordinary case of chorea tends to recover, quite as much as the efficiency of the remedies, that has given them such repute in this condition."

In regard to the value of electrical applications, Dr. Rockwell's views had in many diseases been variously modified, but in regard to their efficacy in chorea, he held the same opinion that he gave a dozen years before, and with this added experience, claims the same position for it in its relation to this disease, as at that time. Dr. Rockwell admitted that there was much adverse testimony as to its value, and quoted in this direction at some length from Von Ziemssen, Hammond, Hamilton, and others. On the other hand it has been greatly praised by Remak, Benedict, Rosenthal, Onimus, Meyer, and others, for its quieting effects upon the muscular contractions.

He could account for the unsatisfactory results, only on the ground of a possible incompleteness of the methods of application, or a lack of persistency in the efforts made. He presumed that he would not be contradicted when he asserted, that electro-therapeutical measures, should be to a large extent, matters of detail. Localized applications will not, as a rule, command success in such a disease as chorea. General faradization and central galvanization he believed to be the essential methods of procedure, and these when attempted, should be carried out with as much care, as other important processes. In the case of this patient, the fact that both rheumatism and paralysis preceded the chorea, would suggest embolism as the cause, but the rapid cure militates against this. It is, perhaps possible, that minute embolisms may have been resolved spontaneously, the subsequent chorea, being the result of the shock to the nervous system. As we may have a distinct cardiac murmur in chlorotic conditions,

and in some of the sequelæ of acute diseases, so it existed here, but the fact that it disappeared as the patient improved, was sufficient evidence of its functional character.

Remarks on Dr. Rockwell's Paper.

Dr. MORTON remarked that he had tried strychnia, arsenic, conium, and electricity in the treatment of chorea, and had become pretty well satisfied that many forms of severe treatment would cure chorea. He thought Dr. Rockwell's experience with conium would be found the same as that with other remedies if given in large doses. It had sometimes seemed to him that the principle of treatment in chorea is one by surprises, so to speak, rather than by specific treatment. As to electricity, he had no confidence in general applications, such as the so-called general faradization and central galvanization. He would expect no more from such treatment than from any surprise to the skin, as for instance the cold douche, bathing, friction and the like.

Dr. EDES said that the dose of conium as given in the book was absurdly small, namely that of five minims. He commenced with a dose of 15 minims and increased it until he obtained the physiological effect. He did not believe that five minims given three times a day would produce any result. In one case conium seemed to do good, but he did not consider that it at all compared in value with arsenic.

Dr. SEGUIN testified to giving conium by the teaspoonful and used Squibb's Fluid Extract; he said that he would give ten and fifteen minims at the first dose to a patient fifteen or eighteen years of age. With respect to treatment he was satisfied with arsenic.

President HAMMOND constantly gave conium in doses of sixty or more minims to adults and in doses of from fifteen to thirty minims to children from five to ten years of age.

Dr. ROCKWELL remarked that he commenced with five drop doses and increased to twenty-five drops at a single dose. He had not been in the habit of recording acute cases of chorea, and it was on this account that he had so much confidence in the treatment used.

The next paper was, "A case of athetosis cured by nerve-stretching." By GRÆME M. HAMMOND, of New York.

For the last ten years nerve-stretching has been resorted to, with more or less success, in almost all spinal and cerebral diseases in which there was the slightest possibility of a cure being

effected. The result of these operations have been as a rule very unsatisfactory in nearly all cases where the disease has been traced to any organic change in the central nervous system. Athetosis, according to the *post-mortem* examinations made on those who have died while suffering from this complaint, comes within this classification and up to the present time after almost all kinds of experiments repeatedly failed, it is unanimously looked upon as an incurable disease. So far as the author was aware only one operation for the relief of this disease has been performed prior to his own, and that was by Dr William J. Morton.

On May 23, 1882. Dr. W. A. Hammond sent to the author of the paper his original case of athetosis, recommending that one or more of the nerves of the arm should be stretched. This patient has been presented to numerous clinics and societies, and three years ago was exhibited to the American Neurological Association. His history is contained in Dr. Hammond's book on "Diseases of the Nervous System."

Up to the time of the operation the movements in the hand continued, with scarcely an instant's cessation, both day and night, interfering with his sleep, and consequently with his general health. His epileptic attacks increased, until he had as many as six or seven a week. On May 27, 1882, Dr. Hammond exposed the median nerve in the middle of the arm at the inner edge of the biceps muscle, and made slight upward and downward traction on it. Immediately after the patient recovered from the influence of the anæsthetic, he could extend his fingers and retain them in any desired position as long as he wished. The pain in the arm was entirely relieved, but the pain in the middle and ring fingers had increased. The movements and pain in his foot had also ceased, and had not up to the present time returned. The patient's general condition has improved steadily, and each succeeding day he has acquired new power. He can now not only dress himself, but can control the movements of his hand sufficiently well to write. Another interesting and remarkable effect of the operation is the influence exerted upon the frequency and force of the epileptic paroxysms, he having had but one since the operation, and that was on the eighth day. It did not last as long nor was it so severe as those he previously had.

Dr. Hammond thought the cure of athetosis by nerve-stretching could only be accounted for in two ways—either the injured nerve must be rendered incapable of transmitting the athetotic impulses, or the effect of stretching the nerve produces such a result

in the diseased organ as to render the conception of athetotic impulse impossible. Preference was given to the latter theory. The patient was then exhibited to the members of the Association.

Remarks on Dr. G. M. Hammond's Paper.

Dr. SEGUIN inquired how much force was used in stretching the nerves.

Dr. HAMMOND replied, very little.

Dr. MORTON said the movements in his case were not so rapid or so constant. In reporting that case he reported two further cases of disease for the relief of which nerve-stretching had not up to that time been tried ; viz.: lateral sclerosis and paralysis agitans. He did not give his patient as immediately useful a hand as in the one just reported and exhibited. He thought, however, at the end of a year that his patient would have a quieter hand. This case was of special interest from the fact of its long standing and the great degree of recovery.

President HAMMOND said that the most astonishing feature of the case to him was the cessation of the movements of the foot and of the epileptic attacks. The patient had previously had from six to eight fits a week. The patient was formerly a very dissipated man, and drank as many as sixty-four glasses of gin per day. He declares that since the operation he has had no pain and no movements at night. Formerly he was an accomplished bookbinder. He expressed great fear of the return of the fits should he resume work at his trade.

Third day, afternoon session.

President HAMMOND called the Association to order at 2.30 P. M.

Present : Drs. Amidon, Bannister, Birdsall, Dana, Edes, Gibney, Wm. A. Hammond, G. M. Hammond, Kinnicut, McBride, Miles, Mills, Morton, Rockwell, Seguin and Spitzka.

In the absence of the Secretary the reading of the minutes of the previous session was dispensed with.

“ A case of swift and one of slow compression of the upper cervical cord from displaced odontoid process : with specimens.”

Dr. V. P. GIBNEY of New York, presented the history of a case of anterior poliomyelitis wherein both inferior and the left superior extremities had been almost completely

palsied, only a few groups of muscles ever regaining any power. There had been and was at time of death an extreme degree of atrophy. Deformity from contraction had been overcome and the boy was enabled by means of orthopædic apparatus and crutches to walk short distances. He finally died of compression of the upper cervical cord from displacement of the odontoid process, the ligaments having become separated from their attachment by disease of the occiput and contiguous vertebræ. This case was also employed to illustrate the doctor's next communication.

Sections were made from the brachial enlargement exhibited very marked atrophy macroscopically even, of the left anterior cornua, and microscopically there were in some sections only one or two ganglion cells to be seen in the cornua of the left side, while in those of right side there were as many as fifteen in the field. Clark's columns exhibited the same lesions only not so marked as in the cornua. In section from the lumbar cord both anterior cornua were atrophied and scarcely any large cells could be found. An occasional patch of shrivelled cells was brought out by the carmine staining.

The case, as above mentioned, was now used to illustrate *swift compression of the cord*, and the history briefly was, that the boy fell, his occiput coming in rather violent contact with the floor. Pains, torticollis, and abscess followed, all within six weeks. The first abscess was to the left of the occipital protuberance and a deep incision was made, the bistoury coming in contact with bare bone. Shortly afterward a retro-pharyngeal abscess appeared and was opened. He died suddenly, nearly three months after the date of the injury, one evening as he attempted to turn in bed.

The autopsy revealed the tip of the odontoid imbedded in the cord and an erosion of the occipital condyles at the point of insertion of the transverse and check ligaments.

Sections through the portion compressed exhibited fine examples of myelitis of a degenerative character.

The second case was that of a boy aged 11 years, whom Dr. Gibney first saw February 27, 1882. He had a left spinal hemiplegia and a torticollis with enlargement of the spinous process of the second cervical vertebra. The torticollis dated from a blow in September, 1881, followed in four weeks by glandular suppuration. The loss of power was not observed until the latter end of the year.

There was preservation of reaction to both currents. He was

treated with a head support and faradism, with good results, up to April 1st. Was removed from hospital; shortly afterward treatment was suspended, and within a fortnight he became paralyzed in all four extremities.

On the morning of the 29th he raised his head in bed, gave a wildish stare, and expired.

The autopsy revealed a sclerosed condition of the arches of the spinous process of second cervical vertebra and a projection of the odontoid process backward into the spinal canal. The cord was found indented correspondingly and quite flaccid here.

Sections through this portion showed well-marked degenerative myelitis and sclerosis in the columns of Türcck. Lower down there was marked increase of the neuroglia in the postero-external column.

The anterior horns presented very few changes; the parts corresponding to the crossed pyramidal tracts exhibited the most-marked.

In sections above the point compressed and in the decussation, nothing more than a high degree of vascularity was observed.

Dr. GIBNEY acknowledged his indebtedness to Drs. Amidon and Birdsall for assistance in the preparation of the specimen.

Remarks on Dr. Gibney's Paper.

Dr. MORTON called attention to an extremely interesting specimen in this city illustrating the class of injuries described. It was in the hands of Prof. William Darling, and represented a fracture of the odontoid process and atlas; the spinal canal being reduced to the size of the little finger. The patient must have survived the accident quite a number of months, as the fracture is perfectly united. The specimen is interesting as showing with how small a vertebral canal a patient may continue to live. In relation to the same class of injuries, Dr. Morton has reported a very unique case, namely dislocation of the fifth cervical vertebra which was reduced at once by hanging the patient by the neck and chin. The patient exhibited the symptoms of almost complete cervical paraplegia. There was cutaneous anæsthesia of the arms and legs. The head was thrown backward, the chin upward and forward.

Dr. GIBNEY said that, as an illustration of the amount of pressure which the cord would bear, that Dr. Yale had reported a case of fracture of the odontoid process in which the man lived several

months, though he was tormented by a frightful neuralgia. Upon *post-mortem* examination, the canal was found very narrow. It was also true that patients suffering from Pott's disease, or with cheesy masses pressing upon the cord, lived for a long time, even after the occurrence of paraplegia.

REPORT OF THE COUNCIL.

The Council reported, through Dr. Seguin, favorably, and recommended for active membership, Dr. C. L. Dana, of New York.

The Council reported favorably upon and recommended for associate members, Drs. Mierzejewski, of St. Petersburg, and Auguste Ollivier, of Paris.

These gentlemen were all duly elected by vote of the Association.

"The disease of the Scythians (*morbus feminarum*) and certain analogous conditions," was the title of a paper by WILLIAM A. HAMMOND, M.D.

From a very early period the idea had existed that the male inhabitants of the Caucasus are subject to a peculiar disease, the chief characteristics of which are the loss of the physiological and moral attributes of man, the supervention of impotence, the disappearance of the beard, the atrophy of the penis and testicles, and eventually the implication of the mind to such an extent that the subjects believing themselves to be women, clothe themselves like women, and adopt the manners, custom, and occupation of the female sex. Mention of this disease was first made by Herodotus, and next by Hippocrates, the latter considering it due indirectly to horseback riding, which was largely practised by the Scythians, and directly to the "opening of two veins which are near the ears," which he supposes to be in intimate relation with the generative organs. This custom was a prevalent practice for the relief of enlarged lower extremities, brought about by excessive horseback riding. A very full historical sketch of this and allied conditions was given, from which it appeared that the Scythians of an early day, and their descendants, were particularly subject to sexual impotence, and that this condition is accompanied with such moral and physical changes in the affected individuals, as to cause them to look like women, and to acquire the mental characteristics and instincts of the female sex.

Dr. Hammond's attention was first drawn to this subject over thirty years ago, when he was on duty as a medical officer of the army. He was stationed at an Indian village inhabited by Pueblo Indians. It was told him, with many injunctions of caution and secrecy, that among their number was an individual whose sex had been changed from male to female. Dr. Hammond took great pains to investigate this rumor, and made several journeys to neighboring towns, in company with the chief, for this purpose. He saw and examined several of these individuals. One was described as having a remarkable development of the mammary glands; the pubis was devoid of hair; the penis was greatly shrunken, being not over an inch in length, nor of greater circumference than the little finger. The testicles apparently consisted of nothing but connective tissue, and were about the size of kidney beans. There was no genital deformity whatever. The limbs and the whole body were full and rounded, and there was not a sign of hair anywhere except on the scalp. Voice shrill and weak; and when naked his whole appearance was more that of a woman than a man. When he put on his woman's clothes there was absolutely nothing in his appearance by which it could be determined that he was of the male sex. Dr. Hammond, after patient inquiry, ascertained that these individuals were an essential person in the annual orgies which were indulged in by the Pueblo Indians. They are the chief passive agents in the pæderastic exercises which form so important a part of the ceremonies. Hence it is that this condition is intentionally brought about. To this end the most virile man is selected, and the act of masturbation is performed upon him many times every day; at the same time he is made to ride almost constantly on horseback. By these and other means the peculiar evolution above described is finally effected. Among the Scythians this condition is the incidental result of customs, while the Pueblo Indians intentionally produce it for a specific purpose.

The case of Lord Cornbury, governor of New York during the reign of Queen Anne, was mentioned as a remarkable example of a man who delighted in clothing himself in female attire. He was probably what is now called a "reasoning maniac."

Remarks on Dr. Hammond's Paper.

Dr. SPITZKA thought it was necessary to do as Dr. Hammond had done, to draw the line between sexual perversion and those lunatics in whom there is no sexual perversion.

He had sometimes thought the condition referred to was due to a defect in the development of the brain. Up to the third week of development all members of the human race are male, even those who were to be females.

Now the change which results in the determination of the sex may be intercepted, and a hypospadias or other congenital malformation occur, and thus we may account even for the external resemblance of males to the female sex.

As to Lord Cornbury he did not consider him a reasoning maniac; nor did the doctor think he dressed in woman's clothes to curry favor with the queen, for that was unnecessary.

Dr. SEGUIN inquired of the author of the paper if he was informed of the case of a medical gentleman who lived within fifty miles of New York, and who, notwithstanding his habitually appearing in female attire, retained the respect and esteem of the community in which he lived.

Dr. HAMMOND replied to the last question in the affirmative, and said he had frequently talked with this doctor, and was well acquainted with the facts in his case.

In regard to Edwin Hyde (Lord Cornbury), Dr. Hammond did not think he could be called a lunatic to any extent. He was, the doctor thought, a reasoning maniac.

Dr. F. T. MILES, of Baltimore, exhibited some morbid specimens, and presented a brief history of a "Case of hemorrhage into the pons; death eleven months after."

Mary B., æt. 40, stout and vigorous, after several days suffering with severe headache in the back of her head, was suddenly paralyzed in June, 1881. Her description of the attack was that she felt at the time "as if she was drunk"; her head swam, she staggered, and fell unconscious. Upon recovery of consciousness she found that she could not move her right arm or leg, and that the hearing of the left ear had suddenly become bad. A few days afterward she observed that the sight of the left eye was getting dim, the cornea became milky, and this trouble increased until she became totally blind. She never lost feeling on either side of the body. [Some time after her attack there was rigidity of limbs, which lasted two or three months.(?)]

About four months after she was paralyzed she was examined by my friend and former pupil, Dr. H. Berkley, of Baltimore, to

whose kindness I owe the account of the case. He found an incomplete paralysis of the right limbs. The grip of the hand was considerably diminished, though it could be raised to the head with an ataxic movement, which was also seen when she attempted to touch the end of her nose with the eyes shut. The right leg could be moved slightly. There was double facial paralysis. The paralysis of the face was more marked than that of the limbs. The tongue was protruded to the right with an irregular, uncertain motion; the upper surface concave. The speech was slow and drawling. There was rigidity of the temporals and masseters (whether on both sides is not distinctly stated), so that the teeth could be separated from each other for only about $\frac{1}{4}$ of an inch. Tactile sensibility of the paralyzed limbs was unimpaired. The sensibility of the right side of the face is good, except a patch of anæsthesia over the masseter. On the left side of the face, all the region supplied by the supra-orbital branch of the fifth nerve was anæsthetic and analgesic; nowhere else was sensibility altered. The tongue preserved its tactile sensibility. The cornea of the left eye presented a fleshy thickening (pannus), which protruded between the lids, preventing their being closed. This diseased cornea appeared not to have entirely lost sensation. There was increased lachrymation in the left eye, causing a continual weeping.

The movements of both eyes were perfect. There was total deafness of the left ear. Taste and smell were not affected.

There was complete incontinence of urine and fæces. No ridging of the nails could be seen on the paralyzed side. Flushes of heat, with redness and a sensation of tingling, passed over the paralyzed side occasionally; indeed, the whole of that side appeared redder than the sound side.

Some three months before death the left eye shrank within the lids, and about the same time the rigidity of the jaws passed off, and she regained the use of the muscles on the right side of the face. During the time she was under observation there was no interference with the function of respiration or of deglutition. There was no polyuria; no albumen in urine.

The autopsy revealed a focus of hemorrhage in the left side of the pons, approximating the floor of the fourth ventricle, and extending several lines from above downward, the bulk of the clot being a little above the level of the acoustic striæ. The rest of the brain exhibited nothing noteworthy.

"The mechanical effects of nerve-stretching upon the spinal cord," by Dr. C. L. DANA, of New York.

The spinal cord hangs rather loosely in its canal. It changes its position in the different movements of the trunk. The question in nerve-stretching, therefore, is essentially, not whether the cord moves, but whether it is stretched. The spinal cord is quite firmly connected with the dura mater. This is fastened to the borders of the foramen magnum; below, it extends over the nerve roots into the intervertebral canals, and is continuous with the nerve sheaths. In pulling on the sciatic nerve the traction comes on the cord and dura together, but chiefly on the latter.

The obstructions which prevent traction on a nerve from moving the cord are :

First.—The union of the nerve to its sheath, and of that to the surrounding soft tissues.

Second.—The union of the sheath to the wall of the intervertebral canal. Here the nerve makes an angle also, and force is thus lost. The union in the canal may be very firm, and it is here that the strongest opposition is found.

Third.—The extensile character of the nerve itself.

From experiments made, Dr. Dana estimated that the spinal cord, as a whole, when removed from the body, could be stretched $\frac{1}{2}$ to $\frac{1}{8}$ its length, or something over an inch.

Anatomical and clinical evidence was adduced, showing that the spinal cord may be stretched when the sciatic, crural, or brachial nerves are pulled upon. Experimental evidence was also brought forward for and against the idea that the cord moves when the above-named nerves are pulled upon.

Clinical evidence to the effect that the cord was stretched by pulling on the sciatic was derived mainly from cases in which the *cutting operation* had been done. In *subcutaneous nerve-stretching* the evidence that any central change is produced is very slight. The following conclusions were drawn :

A.—As regards the cutting operation.

(1) Traction upon the sciatic nerve in the cadaver in the majority of cases, but not in all, stretches the cord.

(2) This stretching is greatest at the lower part, amounting to 2 or 3 mm. with a very powerful pull.

(3) The movement is distributed over the yielding cord, and only in a minority of cases does it reach the medulla; the medulla then moves very slightly, less than 3 mm.

(4) When the cord is not moved, it is due, probably, to the

strong adhesion of the sheath to the nerve, and of that to the surrounding tissue, especially in the intervertebral canal.

(5) Traction upon the nerve and sheath, if it reaches the spinal canal, acts chiefly upon the dura; that is, the cord is stretched partly by direct force, but chiefly by the movement of the enveloping membrane.

(6) It may be legitimately inferred that what happens in the cadaver occurs also in the living subject.

B.—As regards subcutaneous nerve-stretching.

(1) On the cadaver this is a powerful means of moving the cord.

(2) In the living subject it is very doubtful if subcutaneous nerve-stretching affects the cord mechanically at all. The clinical evidence is very meagre; anatomical evidence cannot be obtained.

Remarks on Dr. Dana's Paper.

Dr. MORTON had, at the invitation of the author of the paper, witnessed the experiments upon the cadaver referred to, and could testify to the care with which they were performed. He was convinced that the spinal cord was moved. In these experiments the dura mater was seen to wrinkle longitudinally when subcutaneous nerve-stretching was resorted to. He thought these experiments left no doubt as to whether the cord moved; in other words, is exercised. He thought the subcutaneous method would be the one most frequently used in preference to the cutting operation, as it was within the reach of all. Any physician could give an anæsthetic and move the limbs. He had used this method in cases of lateral sclerosis and observed benefit from it. Dr. Morton could not yet testify to great results, but in one case of paralysis agitans some relief was effected by subcutaneous nerve-stretching; and in a second case of this same disease, treated by surgical nerve-stretching, even more benefit had been obtained.

Dr. EDES inquired what was the minimum pull upon the sciatic nerve.

Dr. BANNISTER inquired if injury might not result from nerve-stretching should there be adhesion of the cord at various points.

Dr. G. M. HAMMOND inquired if the pull was exerted only toward the spinal cord or in both directions.

President HAMMOND had very little doubt, if any, that the spinal cord is stretched by the cutting operation, and he was also

confident he had stretched it by the subcutaneous method. In one case of spinal sclerosis he stretched both sciatic nerves by the subcutaneous plan, and produced very decided irregular action of the heart and vomiting. The subcutaneous method could not be practised with fat persons; here the cutting operation would be necessary. The pain accompanying the practice of the subcutaneous plan was not great. In a case where he performed the operation a number of times, ether was first given, and afterward no anæsthetic was used.

Dr. DANA said that Voigt had made some experiments from which he concluded that it was impossible to stretch any normal nerve subcutaneously to an abnormal extent. Subcutaneous stretching does stretch the sciatic nerve somewhat, but Dr. Dana doubted whether it had any effect upon the cord. The minimum pull on the sciatic nerve used in experiments was less than ten pounds.

Dr. MORTON feared that subcutaneous nerve-stretching was receiving scanty justice. He would like to call attention to the fact that a much greater and more effectual stretch could be effected by carrying the leg outside the line of the body, than when kept within the body line. Again, it was probable that the nerve was stretched to a greater extent in disease than in health, as it then might often be in a swollen or in a rigid condition.

Dr. DANA thought we made a mistake when we assumed that the spinal cord was stretched by the subcutaneous method.

Dr. R. T. EDES, of Boston, next read a paper on so-called "Spinal Concussion," in which there was degeneration of the postero-lateral columns.

The paper was intended to point out the occurrence, in a certain number of cases of somewhat obscure pathology, of a definite and well-known lesion.

He had not been able to find any statement of the frequent occurrence of this lesion, or its symptoms, among the very various and vague sequelæ of spinal concussion. Several cases had occurred in his hospital service, in which the clinical evidence of degeneration of the postero-lateral columns of the cord had been very clear, and where the causation had seemed to be a severe shock to the spinal column, producing no appreciable osseous or ligamentous lesion. Brief histories of four cases, with remarks, were given.

Dr. EDES exhibited an instrument for percussion to be used in

connection with an electrical apparatus, by means of which a tracing was obtained indicating the time to $\frac{1}{300}$ part of a second. The instrument was the invention of Mr. Brown, a hospital *interne*.

There being no discussion, the Association adjourned.

Evening session, third day.

President HAMMOND called the association to order promptly at 8.30 P.M.

Present—Drs. Amidon, Dana, Edes, G. M. Hammond, W. A. Hammond, Kinnicut, Miles, Mills, Rockwell, Morton, Seguin, and Spitzka.

The Secretary read the minutes of the afternoon session, which were approved.

Dr. WILLIAM J. MORTON read a paper entitled "Notes on a year's progress in medical electro-therapeutics by statical electrization."

Referring to the historical phases of statical electrization, the reader called attention particularly to the very recent period of the growth, extending from 1879 up to the present time. This period, chronologically brief, was full of both promise and realization. Statical electricity was now prominently before the profession.

Progress was recorded in many directions.

1. *Machines.* Excellent machines of a variety of sizes and especially equipped for medical use could now be obtained in America. The number of revolving plates in some of these had already been increased up to eight, thus ensuring a large working *quantity* of electricity. This the reader considered of much importance, since there existed a tendency in certain quarters to make use of toy Holtz machines. The glass case added by Dr. Vigouroux had proved to be a lasting improvement. The ingenuity of Messrs. Hall and Berg, the American manufacturers, had furnished us with self-charging machines superior to those brought home by the reader from Paris at the time when he had first introduced the subject of statical electrization to the profession two years ago. In place of the somewhat cumbrous French contrivance of a separate wheel and cushions, a piece of cat's skin was permanently glued to a stationary plate, and served as a simple but constant charger.

The substitution of bunches of brass friction wires for the ordinary combs was also an improvement, for the reason that with this device a machine could be very easily charged under adverse atmospherical conditions. It had been estimated that during the last year about four hundred medical Holtz machines had been sold.

2. Electrodes and other appliances for administration. Dr. Graeme Hammond had suggested for an insulating platform a large plate of glass such as is used in sidewalks. This would seem to be an excellent idea.

A number of improved electrodes had been added to the well-known patterns.

Among these are carbon ball and point electrodes, a roller, a rubefacient, an ear and a uterine electrode, multiple copper and steel point electrodes, and an adjustable or "body" electrode, corresponding to the universal discharger of the text-books.

The reader had invented an electrode by which muscular contractions could be produced without the spark touching the body. It consists of two adjustable brass spheres affixed to a handle; one of the spheres is connected to the earth by a small brass chain, while the other is connected to a stem on the end of which is the ordinary sponge electrode. On drawing the spheres apart a spark passes between them, while at the same instant a muscular contraction takes place at the point of application of the sponge. He had also invented two directors. This idea of mechanically directing the spark of an electrode by means of a special appliance was new. One difficulty in administering sparks is to cause them to hit a desired spot successively. A director obviates this. The simplest construction is an ebonite, or glass disc, some six inches in diameter, penetrated at its centre by a small hole. A second form of director is made by enclosing the brass ball electrode in a glass tube tapering to a hollow point like a blunt end syringe.

The new static induced current brought forward by the reader had stood the test of experience, and many physicians using Holtz machines have used it preferably in cases where they had previously employed the induction coil.

Therapeutic Progress.—While conceding the comparative inconvenience of the static machines, the reader felt more confidence than formerly even, that static electricity as a curative form of treatment was fully equal if not superior to galvanism and faradism. The various methods in which electricity was

held to produce cures were passed in review, and the static from these standpoints compared with the faradic and galvanic electricities. A protest was entered against general administrations of electricity. An accurate diagnosis and a localized treatment must be sought for. The standing of electricity would be greatly advanced if electricians would confine their studies to demonstrable reactions such as may be obtained 1st by localized nerve and muscle and secretory stimulations; 2d, by localized reflex and inhibitory action; 3d, by localized alterations of nutrition.

Some of the diseases and affections in which static electricity was especially useful were specifically pointed out.

The hemianæsthesia of hemiplegia, if present, was removed. In the hemianæsthesia of hysteria the effect is very rapid, and permanent.

Theoretically, in progressive muscular atrophy the local effect of the spark should be of benefit. Practically, some excellent results had been obtained.

Two cases of angina pectoris had been treated with a relief from attacks still continuous.

Hysterical aphasia, as might be expected, was easily relieved. Spasmodic asthma had been treated successfully by applications of sparks to the chest and back, an effect due probably to counter-irritation and reflex action.

In locomotor ataxia a single case had been cured of pain and ataxia—absent tendon reflex had alone persisted. Other cases had been treated, but with no permanent benefit. Cases marked by predominating sensory ataxia showed at first a marked improvement, because of regained cutaneous sensibility. The pains of this disease were diminished.

In chorea the results obtained had not been so rapid as by the arsenic treatment.

Static electricity had also been found highly useful in diphtheritic paralysis, lead palsy, rheumatic paralysis, sprains, and writer's cramp.

The diseases in which, in the opinion of the writer, static electricity was equal or superior to other forms of electricity, were paralysees where other forms of electricity would be advised, neuralgias in every form, spinal irritation, rheumatism in all forms except the acute, and hysteria in all its manifestations.

In general it was a peculiarity of the spark to relieve pain—herein its effects were well marked in most forms of neuralgia.

The soreness and tenderness of rheumatic joints, fasciæ, and tendons are more certainly relieved by the spark than by any other method. It was the best method of treating the condition known as spinal irritation.

In hysteria statical electricity possessed an almost specific influence. In order to explain this very constant effect it had often been said that it was due to the impressive nature of the electrical appliances.

This the reader did not believe, since the effects of the electricity referred to followed each other in a fixed succession that in itself proved that the symptoms of cure were a part of the natural history of the disease rather than the accidental sequences of mental impression.

An improved Holtz machine and the new electrodes were submitted for examination. In conclusion, the reader stated that a year's further experience had deeply fixed the conviction, that in certain cases easily specified, and by means of specific and localized treatment, we possess in statical electrization an important addition to electro-therapeutics.

Remarks on Dr. Morton's paper.

Dr. ROCKWELL thought that a point that should never be lost sight of in this connection was the relation of static to other forms of electricity. To determine its comparative value and usefulness would require great experience and much time. His own experience with static electricity during the past year had been very satisfactory, but he did not think it was possible to consider it as valuable therapeutically as either of the other two forms of electricity. The dynamic form had a far wider range which could be readily pointed out. There were some cases in which static electricity was better than other forms, and that was what we ought to consider. He had been much gratified with the use of static electricity in a case of rheumatoid arthritis, and in a case of synovitis of the knee, sent him by Dr. Otis; also in a case of ovarian neuralgia great relief was afforded. He had found in one case that where pain existed and the parts were not tender to pressure, under the application of the sparks the patient recovered after faradism had failed. He had purposely kept his static machine uncovered to learn how much of the time it would work, and had found it impossible to get sparks from it more than half the time. Was this trouble experienced with the covered machines?

Dr. DANA had used statical electricity somewhat during the last six months and had found it a very useful therapeutic agent. He had been more particularly interested in its tonic effects. These had been particularly manifest in two cases, one of topical anæsthesia, the other that of an old gentleman. It would be of value in this relation to know whether statical or faradic electricity was the better. As to this he would not say. It was interesting to note the extent of penetration of the spark. In local applications to the abdomen he had found it aid the action of the bowels. With the idea of further studying its effects upon unstriated muscular fibre he exposed the intestines of a cat and applied a spark, when from a condition of laxity they would begin to contract and become hard and smaller. From this it would seem that sparks applied to the abdomen might have some direct tonic effect upon the intestines.

Dr. AMIDON said one great argument against the use of statical electricity was the bulkiness of the machine, while a faradic battery was compact and could be readily carried in the hand. Except as a counterirritant and a very slight tonic, he thought statical electricity of little value. It was a decided exciter of the imagination, and hence was of value where the influence of the imagination was of advantage. He thought it could not for a moment be compared in value with either of the other currents. The cure of a case of Bell's paralysis and one of progressive muscular atrophy had been mentioned, but he did not think it would be claimed that the latter could be cured. The contraction produced by the statical current causes a great deal of pain. The galvanic current is so much less painful, that the use of the other seemed beyond consideration. The same effects as are produced by the static current can be obtained by a magnet or a mustard plaster. Within the last few months he had seen a case of contracture of the right hand that became completely relaxed and the power restored simply by the application of the faradic current to the extensors of the forearm, and by the use of the faradic brush. Hysterical cases, as he had seen them, would not respond to faradism. Dr. Amidon declared he was perfectly open to conviction as to the value of statical electricity, but he was convinced that it could never take the place of galvanism or faradism. He had never used statical electricity much if any, but had had abundant opportunity of observing its effects in Charcot's clinic. From what he had seen he considered it a useful irritant or stimulant in and about joints, and a powerful

impressing influence upon the imagination of impressionable people.

Dr. G. M. HAMMOND wished to say a word or two about the effects of statical electricity in progressive muscular atrophy. He had four cases. In two cases the atrophy is in the thumb; in the first it is in the right thumb, and in the second both thumbs are affected. In the third case the muscles of the arm, shoulder, thorax, and back are affected. In the fourth case, the muscles of the throat, arms, and legs are the ones affected. At first he began treatment with the faradic current and could obtain but feeble contraction. The use of statical electricity was then resorted to, and upon the first application of this current fine contractions were obtained. All the above-named cases have shown improvement, except the one where the muscles of the arm, shoulder, thorax, and back are affected. This patient though he has not improved has not been getting worse, as was the case before he came under treatment.

Dr. MORTON remarked that the idea was not whether statical electricity would take the place of or drive out of the field either faradism or galvanism, or both, but that it had a field of its own, in which it had special value. It is a mistake to place statical electricity in antagonism with either of the other forms.

In reply to Dr. Rockwell's question he would state that since he had had his machine there had not been a day when he could not obtain a good spark from it. It was well known that unenclosed machines could not be relied upon. For this reason he had always advised the employment of the glass case. One point had been brought out in the discussion which he hoped to investigate, namely, the depth to which the statical current would penetrate; but we were also in doubt as to the depth or extension of the galvanic and faradic currents.

It only remained to notice the strictures which had been passed upon statical electricity in a somewhat wholesale manner by one of the speakers. Dr. Amidon was present at Charcot's clinic at the same time that he was, and it is certainly remarkable that two observers could have witnessed the experiments of Charcot at the same time and have arrived at such diametrically opposite conclusions. Dr. Amidon seemed to think that the imagination was the chief curative factor in the use of statical electrization. Why not apply his argument to other effective methods of treatment, and appeal to the imagination for a solution of curative results brought about by those other methods. It seemed to the speaker that it

required a more vivid imagination to discredit the results of Charcot, Vigouroux, his own, and a host of others, than could ever be evoked from the most susceptible of patients by the use of statical electricity. He was much pleased, however, that statical electricity had gained and was now gaining many warm friends in this country.

The Secretary, Dr. SEGUIN, read a letter from Dr. J. J. MASON, of Newport, R. I., which was accompanied by photographs of the nuclei in the nerve-cells of *iguana tuberculata*.

These were not intended as a challenge to any one, but merely to illustrate what Dr. Mason had found to be true in one specimen only. Of course he was sure that Dr. Spitzka did not refer to cells of the sensory root, for two reasons; the first being that sensation has never been for a moment in question, the nuclei which Dr. Mason had been studying belonging to cells which, although they may possibly have a connection with sensory filaments, are indisputably related to muscles, *e. g.*, oculo-motorius and motor root of trigeminus.

The second reason is that in *Science* for Feb. 19, 1881, vol. ii, No. 34, p. 75, Dr. Spitzka states, writing on the brain of the iguana: "While the cells of the oculo-motorio-trochlearis nucleus are of large dimensions, those of the abducens, facial, and motor trigeminal origin are remarkably small."

In the same periodical, vol. i, No. 7, p. 73, the doctor states: "The remarkable size of the oculo-motor nuclei, and the gigantic dimensions of their almost star-like multipolar nerve-cells, merit mention," etc.

Of course if the nuclei in the cells of origin of the motor root of the trigeminus are smaller than those of the oculo-motorius origin, this fact would settle the case against me. It was, therefore, with somewhat more than usual interest that I examined these centres in the iguana, with what result the photos show. These photographs do not prove, but merely illustrate, what I have found in an unbroken series of sections through both centres. I have found no gigantic cells in the nucleus oculo-motorius or trochlearis, and while the nuclei in the cells of the motor root of trigeminus are relatively smaller than those of the snapping-turtle, there is a good reason for this in the relative difference of development of the jaw muscles in the two animals. In the iguana, as stated in my last article on the subject in the JOURNAL OF NERVOUS AND MENTAL DISEASE, Jan., 1882, the eyeballs measured, antero-

posteriorly, $\frac{3}{4}$ inch. The demonstration, he thought, might be a source of satisfaction to some of the members of the Association in the interest of science.

Dr. SPITZKA remarked that he would admit the correctness of Dr. Mason's statement, if he could convince himself that the nerve-root in question was that of the trigeminus. From the measurements given, there seemed to him no doubt that the large auditory cells had been measured by the doctor; and as far as the shape of the ventricular contour in the photograph, as well as other details, permitted him to judge, the section was taken at a lower level than that of the trigeminus. In reptiles the fifth and eighth pairs are not as widely separated as in the mammalia, and they may for this reason be confounded.

Dr. W. R. BIRDSALL read a paper entitled "A note on the sleeping sickness affecting the negroes of West Africa." He stated that the remarkable condition known under the above name and others, such as cataphora, lethargus, morbus-somnificus, sleeping dropsy (Clark), somnolenza (Gaigneron), hypnosie (Dangaix and Nicolas), maladie du sommeil of the French, Schlafsucht of the Germans, and under the different African names of ni-bazo-nicto, n,tonzi, la-lan-go-to, undoubtedly includes a variety of forms of stupor produced by a variety of causes. The remarks in his paper referred only to the disease as found among the West African negroes, where it assumes such a definite symptom group that it has been considered an endemic disease by several writers; by others, as one peculiar to certain negro tribes. It is characterized, according to the older observers, by a tendency to sleep to an abnormal degree, which gradually becomes more and more profound, the patient rising only to eat or to change his position, or when aroused by some unusual excitement, followed almost immediately by a return to profound slumber. Remissions may occur during which there is a partial return to a more wakeful state, but they are followed by a period of more decided sleep, until it is difficult for the patient to remain awake long enough to take food; he finally lies in a continuous sleep, in which he dies. During all this time there are few outward signs of disease; the pulse is regular, from 70 to 75; the skin cool, sometimes a little below normal; the tongue is moist, sometimes being covered with a white coat. Clark describes "sordes" at the base of the tongue, and in many cases swelling of the cervical glands; the bowels are regular, or constipated.

Slight headache, and a feeling of constriction about the head are often complained of in the early stages, and despondency is observed. The patient grows fat as long as he is able to eat, but in the last stage becomes emaciated, presents a feeble pulse, and dies quietly. In a few cases convulsions or muscular twitchings occur after the stage of profound sleep is reached, becoming less marked as death approaches. The course of the disease is from two months to a year, death being the inevitable result. Dr. Birdsall reviewed the original literature of the subject, including the observations of Winterbottom in 1819 on the Gulf of Benin ; of Clark in 1840 at Sierra Leone, who made six autopsies and observed many cases ; of Dangaix, Gaigneron, and Nicolas ; particularly of Gurin, who observed 134 cases at the Island of Martinique among negroes recently from West Africa, many from the Congo, making 82 autopsies, in which a distended condition of the cerebral vessels was the only abnormal appearance found ; also Dr. McCarthy's observations from Accra, on the Gulf Coast, in 1873. An unpublished letter was read from Dr. H. M. Bachelier, an American physician then at Gaboon, West Africa, written in answer to Dr. Birdsall's inquiries concerning the disease. The following is an abstract :

"Several years ago this disease was considered incurable by the natives, and no endeavors were made to alleviate the patients' sufferings ; but subsequent inquiry and study have revealed the fact that there is an initiatory lesion which readily yields to the proper treatment ; so that they now dread it less than formerly. The disease is ushered in by a chill and headache, the patient loses his spirits, is disinclined to do any thing, moves restlessly about, has a staggering gait, suffused eyes, and dilated pupils. This part of the disease is called '*ozyone*,' and as soon as recognized, his friends take the patient to the country doctors, who understand the condition ; they immediately scrutinize the mucous membrane of the nasal passages and of the pharynx. This is found to be white in color, with an exudation of thin mucus. The bark of a certain tree is obtained, and an infusion made by boiling in a pot ; of this the patient is to snuff up his nostrils a certain amount. Afterward another decoction is prepared, which is used in the same way, and continued till a cure is established. '*Ozyone*' is said to be almost identical with our catarrh. Sometimes circumstances forbid the treatment, and the patient is allowed to retain his '*ozyone*.' This may remain for from two months to a year before decided somnific symptoms present themselves ;

when this stage is reached the patient does little else but sleep ; his appetite, even to the very last, is remarkably good, but as soon as he has finished his meal he immediately retires until the next is ready, when, if he is awakened, he will rise again, eat heartily, and go back to bed. During the sleep the pupils are normal, as also the pulse, temperature, and respiration. The disease attacks men, women, and children indiscriminately. The duration of this condition, which is called by the natives '*Nkanli y' antyávinla,*' is said to be about two months, at which time the patient quietly dies without any other prominent symptom."

All observers, except McCarthy and Bacheler, testify to the invariable fatality of the disease, notwithstanding treatment. McCarthy was informed by the natives, however, that the deep cervical glands invariably become enlarged and that the native doctors extirpate them, always curing the disease. He saw patients who had been operated upon, though he had observed but one case of the disease. He concluded that pressure of enlarged gland upon the vessels leading to the brain, by consequent diminution of the supply of blood to that organ, caused the tendency to sleep. Dr. Birdsall considered that the more recent facts of Dr. McCarthy's observations, and particularly the statements made by Dr. Bacheler concerning the throat affection, point to the disease being one of an infectious character, probably due to the introduction of some special miasmatic poison peculiar to certain parts of West Africa—the hot-bed of such poisons,—introduced perhaps through the mucous membrane and lymphatics, being very slow and mild in its action, apparently that of a veritable hypnotic ; the passive congestion being a concomitant result of its action on the nervous system ; perhaps reproduced within the system, in which case the mucous membrane and enlarged lymphatic glands of the neck might represent a nidus of the *materies morbi*. The absence of enlarged glands in certain cases, according to Clark, who observed them in others, would not allow Dr. McCarthy's theory of pressure on the cerebral vessels to account for the disease.

Dr. SEGUIN thought that seven years ago he had a case of sleeping sickness. The patient was a very black negro brought by his wife to Dr. Seguin's clinic. The only complaint was of excessive sleeping. He could be roused to answer questions but would immediately fall asleep after answering them. By pinching him and calling out he would again wake up. As Dr. Seguin remembered the case, there was nothing further than anæmia

noticeable ; there was no tangible disease. He was very much disappointed at the patient not returning to the clinic.

Dr. MORTON had not met with this sickness among the native Africans though he had lived in a constantly changing community of them in the diamond fields of South Africa, where as many as three or four thousand raw negroes came in every month. However, most of these negroes were from the great central plateau of Africa, consisting mostly of Zulus, Hottentots, Corannas, Bechuanas, Batlapins, etc., etc. ; all of them very different in appearance from the West Coast negro, among whom the sickness described existed. Possibly the West Coast climate, one of the worst in the world, had something to do with producing this lethargy.

Dr. E. C. SEGUIN, of New York, read a paper entitled "Vertebral cancer and paraplegia," which was as follows :

Mrs. P., aged over forty years, was seen with Dr. Burlingham, at Plainfield, New Jersey, on Nov. 10, 1881.

More than twenty years ago, while bathing, was struck in the left breast by a friend's elbow. Felt a good deal hurt at the time, and afterward said to this friend, "If I ever get cancer of the breast I'll blame you for it." No attention was paid to the small induration which remained. In the spring of 1879 this lump grew and caused some pain. Dr. Burlingham, and Dr. Willard Parker of New York, advised its removal, which was done by Dr. Hart in the same year. The tumor was examined by some one for Dr. Parker, and was reported to be "myxo-sarcoma."

In a few months a marked recurrence of the disease took place in the breast, with involvement of the axillary glands. A second operation was done by Dr. Hart in June, 1880 and every thing removed ; it was a remarkably clean operation.

Since that operation there has been only a small varying (?) tumor near the anterior axillary fold. Patient was married in the autumn of 1880. Soon became pregnant and seemed well.

In December, 1880, driving home through the snow, was exposed to a cold wind, and both her feet wet. She fancied that the cold air "struck her left hip." In about two weeks began to complain of pains about the region of the left anterior superior spine of the ilium and below. Later had pain in right anterior femoral region.

In January, 1881, had a first attack of spasm in the back. The head was thrown back, and the lower part of the back was

tense, painful, and causing the body to be thrown backward. She continued to have more or less of this "drawing" feeling in the lower part of the back, often as low as the sacrum. Then she could not stoop or bend forward.

Before her confinement early in February the pain appeared in both anterior femoral regions. This was a sudden attack of pain with "drawing" in the back; the pain then increased, with spasm or cramps, throughout the hips, thighs, and feet. These attacks often lasted half an hour. Forceps were used in the confinement; it was otherwise normal.

In the spring she seemed better; went about on foot, but had the same cramp-pains developed early in the morning by turning in bed. No numbness. In July was at the sea-shore quite wretched. In August Dr. Burlingham went to see her in consultation with Dr. Fisk. She then had more pain in the hips and back; lay in bed, afraid of any movement (of the left leg especially). Could not bring her heel to the ground.

Toward the end of September there was gradual loss of power in the right leg, then complete palsy of the left leg, and lastly the right leg was completely palsied; at the same time there were loss of feeling in the legs, and partial retention of urine.

Six weeks ago (about October 1st) the paraplegia was complete, with anæsthesia, but no abnormal reflexes, and has so remained. Has lost color and weight progressively; no fever (?). Complete extension (or rather the attempt to do this) causes severe tearing pains deep in the abdomen, above the umbilicus. Has a pseudo-cincture feeling above the umbilicus. Of late there have been some reflex movements in the legs.

Examination.—The patient exhibits complete anæsthesia below a level one inch above umbilicus in front, and as low as the posterior superior spine of the ilium behind. All voluntary power is lost below the epigastrium. Abdomen much distended; impacted fæces can be felt in the ascending and descending colon. Pricking causes reflex movements. There are no symptoms above the umbilicus, except the axillary tumor (quiescent nodule).

The spine presents two deformities: First, a well-marked kyphosis composed of three vertebræ in the lower dorsal region. Below this the spine is displaced anteriorly, and below; in the lumbar region there is another kyphosis.

The pains have ceased for several weeks. No alteration in nutrition; some œdema of the paralyzed limbs. Bladder quite full (now micturates by reflex action). In August, Dr. Fisk found

a little albumen and some casts ; none since. Nurse reports thirst and flushing of cheeks in afternoon. Reflexes all raised.

Diagnosis.—Pott's disease in lower mid-dorsal region, probably from cancer of the vertebræ and of the dura mater ; compression of the spinal cord.

Clinically the symptoms are those of Cruveilhier's "*paraplégie douloureuse*." Advise no treatment. If pains return morphia to be given freely.

On December 30th I received the following letter from Dr. Burlingham :

"Dear Doctor : The patient, Mrs. P., you saw with me died yesterday morning. There had been no very material change in her condition since you saw her, except a gradual and general loss of strength. The appetite was good, and digestion well-performed. The distension of the abdomen was much less, and the 'drawing' pains had almost ceased. Urine passed sometimes without her knowledge, and about two weeks ago was very bloody for a couple of days. The evening temperature ranged from 100° to 104° ; morning temp. nearly normal. For the past month there has been a very considerable reflex action in the legs, the left one more violently ; and she complained of her feet aching.

"Bed-sores formed over the trochanters and the sacrum. Forty-eight hours before death she first complained of stiffness about the jaws. Clonic spasms now followed, involving the facial and throat muscles, and causing a fear of choking to death. These continued till about half an hour before death.

"A *post-mortem* examination was made about eight hours after death.

"The spinal column only was examined. I send herewith the portion removed for your inspection.

"We did not find the bodies of the vertebræ in the condition in which you regarded them at the time.

"The mental condition of the patient remained clear until within fifteen minutes of death."

Had not Dr. Burlingham taken the trouble to send me the vertebræ the case might have remained an anomalous and discouraging one for the student of spinal affections. The bones viewed externally after death seemed nearly normal.

The portion of the vertebral column sent consisted of two segments, one from lower dorsal and one from the lumbar region.

In both these portions, several bodies contained round masses

of grayish gelatinous cancer, some nearly one inch in diameter, quite destroying the cancellous body. At two points, one in the dorsal region, there was absence of an entire body, with projection of the anterior wall of the vertebral canal upon the spinal cord, causing compression of that organ; this was at the 10th dorsal. The adjacent bodies had come together, causing the kyphosis observed during life. A similarly total destruction of a vertebral body had taken place in the third lumbar vertebra, causing some pressure upon the cauda equina. The smaller nodules were of varying size and age; all, however, gelatinous and tending to the classic globular form. There was no trace of intra- or extra-spinal cancer.

A microscopic examination of the spinal cord showed no distinct secondary degeneration, but a well-marked, diffused myelitis. This finding, with the fact that the projection of the remains of the 10th dorsal vertebra in the canal was small, makes it probable that the spinal cord suffered more from an irritative process than from simple compression.

Dr .H. D. SCHMIDT'S (New Orleans) paper¹ on "A case of tumor of the fourth ventricle of the brain, unaccompanied by special symptoms," was read by title.

There being no further business, the President thanked the members for their courtesy, wished them all a safe return to their homes, and, upon motion, declared the Association adjourned until the third Wednesday in June, 1883, the place of meeting to be hereafter determined by the Council.

¹See this number of JOURNAL, page 509.